ZANZIBAR PROTECTORATE.

ANNUAL REPORTS

ON THE

MEDICAL AND PUBLIC HEALTH DEPARTMENTS

FOR THE YEAR

1922.

ZANZIBAR:

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1923.

ZANZIBAR PROTECTORATE.

REPORT ON THE MEDICAL DIVISION

FOR THE YEAR 1922.

Owing to sickness and invaliding among the members of the medical staff it is to be regretted that the progress hoped for during the year 1922 in the Medical and Public Health Departments did not materialize to the extent desired.

The Principal Medical Officer, Dr. H. Curwen, C.B.E., was invalided on account of Pulmonary tuberculosis on 6th February, 1922.

Dr. H. Waller, Medical Officer, was invalided on account of continued pyrexia (influenza) on 11th April, 1922.

Dr. J. S. de Sousa, Acting Principal Medical Officer, went on leave on 29th June, 1922, after 25 months' service.

The Senior Medical Officer of Health assumed the duties of Acting Principal Medical Officer on 30th June, and undertook the operative work at the hospital and the medical charge of European officers and their families. This left very little time for the routine work of the Health Department, and no new measures, such as propaganda work on preventive treatment for local diseases, *e.g.*, ankylostomiasis, could be undertaken.

Dr. H. G. Phippen, on the departure of Dr. de Sousa, took charge of the medical and surgical beds and out-patients.

Dr. H. C. Quin, Assistant Medical Officer of Health, arrived from England on 28th July, on first appointment. In addition to his duties in the Public Health Division and work as School Medical Officer, he took over medical charge of the prisons, asylum and King's African Rifles.

Dr. Waller returned from sick leave on 30th November, 1922, and resumed charge of the surgical beds, out-patients and operations.

Dr. Phippen then took over charge of the prisons, asylum and King's African Rifles, and paid weekly visits of inspection to Mkokotoni, Selem, Mwera and Chwaka dispensaries.

Dr. H. Curwen, Principal Medical Officer, was finally invalided from the Service on 20th August, 1922. I wish here to place on record the great loss the Medical and Public Health Departments have suffered by reason of his retirement.

Dr. R. Howard, M.B.E., was in charge of Weti, Pemba, throughout the year.

Dr. P. L. Craig was in charge of Chake Chake, Pemba, from January to February and from July to end of year.

Dr. J. A. Taylor, Senior Medical Officer, Uganda, was appointed Principal Medical Officer, but has not yet assumed the appointment.

Mrs. K. Zurcher, Matron, returned from leave on 18th April and was stationed at the Native and Subordinates Hospital.

Miss Chambers was Sister-in-charge of the European Hospital until going on leave on 29th June, when Sister Marson took over.

Miss Gittins, Nursing Sister, was stationed at the Native Hospital until going on leave, on 7th August.

Mrs. Howard, Nursing Sister, was stationed at Weti, Pemba, throughout the year.

Miss Marson, was stationed at the Native Hospital until taking charge of the European Hospital as mentioned above.

Miss Bailey returned from leave on 4th June and was stationed at the Native Hospital.

Miss Wilson arrived from England on 22nd February on first appointment, and was stationed at the Native Hospital.

Europeans.

General.—The general health of the residents has been satisfactory. Thirty-one cases of malaria occurred during the year, of which probably not more than two were infected in the Town proper.

European births numbered two, European deaths numbered one. This death was due to cerebro-spinal meningitis in a non-resident and is referred to in the Public Health Department Report.

Common Ailments.—Gastric and hepatic disorders and catarrhal conditions.

A mild form of influenza was prevalent in the latter part of the year.

As compared to 59 in-patients during 1921, there were 81 admitted during 1922. Of these 46 were non-Government Europeans.

Four major operations were performed during the year as follows :—Appendicectomy, 2; ischio-rectal abscess, 1; radical cure of hernia, 1.

The new European Hospital is nearing completion and should be in use in the latter part of 1923.

Invalidings of Officials.—Six officials were invalided during the year for the undermentioned causes :—

Phthisis	1
Continued Pyrexia (Influenza) ...	2
Chronic Malaria	1
Obscure abdominal symptoms ...	1
Neurasthenia	1

Non-European Officials.

General.—The general health of the non-European officials throughout the year has been satisfactory.

Admissions to hospital numbered 83 as compared to 58 last year. This increase is partly accounted for by the increased staff of non-European officials.

Common Ailments, etc.—The following table shows the commonest causes of admission :—

	Admissions.	Deaths.
Malaria	26	—
Undefined Fever ...	2	—
Black-water Fever ...	5	1
Influenza	11	—

One death occurred during the year, a dispenser at Mkokotoni succumbing to black-water fever.

Invalidings.—Six non-European officials were invalided during the year for the undermentioned causes :—

Acute Insanity	1
Chronic Glaucoma and Cataract...	1
Black-water Fever	1
Obscure abdominal symptoms ...	1
Diabetes	1
Pleurisy with effusion ...	1

Out- and In-Patients.

The number of out-patients was 10,912 as compared with 9,599 in 1921, an increase of 1,313.

The number of in-patients was 1,183 as compared with 751 in 1921, an increase of 432.

Operations.—Operations performed during the year totalled 192 and were of the following description :—

Major	...	...	62
Minor	...	...	130
General Anæsthetic		...	181
Local Anæsthetic	...	...	11

The major operations performed were as follows :—

Laparotomy	...	...	3
Ovariotomy	...	...	1
Hysterectomy	...	...	4
Intussusception	...	...	1
Herniotomy	...	...	28
Elephantiasis Scroti	...	...	10
Amputations	...	...	13
Cæsarean Section	...	...	2

Maternity Cases.—The number of maternity cases was 12, of these three were abnormal. These included one case in which, owing to non-descent of the head, it was decided to perform Cæsarean Section, the fœtus was found lying free in the peritoneal cavity and there was an extensive tear on the posterior surface of the uterus.

Venereal Diseases.—The number of cases of gonorrhœa showed an increase over last year from 690 to 711, whilst 463 cases of syphilis (all manifestations) were treated as compared to 324 last year. A few cases were treated by intravenous injections of arsenic compounds.

Bilharzia.—Cases were diagnosed during the year under review. The possibility of bilharzial infection occurring in Zanzibar Island is being investigated by the Economic Biologist.

Undefined Fever.—A large number of cases are labelled with this unsatisfactory diagnosis. The condition is probably due to a variety of causes. Many cases are probably malaria, others due to catarrhal or influenzal conditions, whilst undoubtedly great numbers are due to disordered digestion and constipation.

Blood films are now examined in all cases where the temperature is above 100 and in all continued fevers admitted as in-patients, agglutination tests are performed.

Other infective diseases are dealt with in the Report of the Public Health Division.

The diseases predominating among the native population are ulcers, bronchial, venereal, malarial, filarial and ankylostomiasis. Malignant disease is uncommon.

Ziwani Military Lines.

The number of troops vary considerably and the Companies are changed every six months.

Numerous cases of malaria occur, but the infection is probably acquired elsewhere.

The health of European officers and their families living there has been good. Two cases of malaria occurred amongst them, but one case is known to have had a previous attack on the mainland.

Great improvements have been effected in the surroundings by extensive clearing, tree felling and draining.

Asylum for Insane Natives.

The subjoined table gives the number of admissions and deaths for 1922 as compared to 1921.

The health of the inmates has been good and they seem fairly contented.

	Remaining end of 1921.	Admitted in 1922.	Discharged in 1922.	Died in 1922.	Remaining end of 1922.
Males	4	11	1	2	12
Females	8	2	2	1	7
Total	12	13	3	3	19

Kilimani Central Prison.

The health of the prisoners during the year under review has been on the whole good. All prisoners on admission are weighed, if necessary vaccinated, and their blood and stools microscopically examined. The percentage of prisoners showing malarial parasites on admission was 16%. The percentage of prisoners showing ankylostome infection on admission was 72%.

These prisoners are immediately placed under treatment for these diseases. During the period of their incarceration the prisoners are periodically weighed, sick prisoners are seen daily by a Sub-Assistant Surgeon, and, if necessary, admitted to the Prison Infirmary. Severe cases of illness are removed to the Native Hospital.

The Medical Officer in Charge pays visits twice weekly and if necessary oftener. He sees all prisoners at least once a week.

The total number of prisoners admitted to the Prison Infirmary and Native Hospital was 318 as compared to 800 in 1921. Deaths among the prisoners numbered two as compared to four in 1921, the cause of death in each case being pneumonia.

The prevailing diseases were ankylostomiasis, malaria and ulcers. No epidemic occurred in the Prison during the year under review.

The prisoners live in large, airy cells with whitewashed walls and cement floors, which are washed out daily.

The prisoners are employed in the following occupations :— Coir making, tailoring, tinning, woodcutting and with the Public Works and Agricultural Departments.

Conservancy is on the bucket system, the pails being removed frequently during the day to the prison incinerator, which is also used to burn all refuse.

The diet tables of the African and Asiatic prisoners are appended herewith.

ASIATICS, INCLUDING ARABS.

Sunday.—1 lb. of wheat flour, ½ lb. of rice, 4 ozs. meat, and a daily issue of 4 drms. curry powder, 4 drms. salt, 4 drms. onions and 4 ozs. dhall.

Monday.—1 lb. of bajri flour, ½ lb. of rice, 4 ozs. of fish and as above.

Tuesday.—1 lb. of wheat flour, ½ lb. mtama and 4 ozs. of meat and as above.

Wednesday.—1 lb of bajri flour, 1 lb. of rice, and 4 ozs. of fish and as above.

Thursday.—1 lb. of wheat flour, ½ lb. of mtama and 4 ozs. of meat and as above.

Friday.—1 lb. of bajri flour, ½ lb. of rice and 4 ozs. of fish and as above.

Saturday.—1 lb. of wheat flour, ½ lb. of mtama and 4 ozs. of meat and as above.

NATIVES OF AFRICA.

Sunday.—1 lb. of rice, ½ lb. of beans, 4 ozs. of fish, and a daily issue of 4 drms. curry powder, 4 drms. of salt, 2 drms. of onions, 1 chillie, 1/10th of a coconut and 1/15th of a lemon.

Monday.—1 lb. of mtama, ½ lb. of rice, and 2 ozs. of choroko and as above.

Tuesday.—1 lb. of mtama, ½ lb. of beans, and 2 ozs. of choroko and as above.

Wednesday.—½ lb. of rice, 1 lb. of mtama and 4 ozs. of fish and as above.

Thursday.—1 lb. of rice, ½ lb. of mtama, and 4 ozs. of choroko and as above.

Friday.—1 lb. of mtama, ½ lb. beans, and 4 ozs. of choroko and as above.

Saturday.—1½ lb. of mtama, and 4 ozs. of fish and as above.

No alteration or improvement in diet or sanitation was made during the year. The diet appears satisfactory, and the sanitation effective as judged by the low death rate and the general good health of the year.

The buildings are well constructed and admirably suited for the purpose for which they are intended. The cleanliness, discipline and good order of the Prison leave nothing to be desired.

One Sub-Assistant Surgeon is in charge of the Military Lines, Prisons, and Asylum, and resides at the Lines. The Medical Officer in Charge pays regular visits.

District Dispensaries.

Dispensaries are situated at Mkokotoni, Chwaka, Mwera, Selem and Koani.

Resident Dispensers are stationed at Mkokotoni and Selem.

A Sub-Assistant Surgeon visits Chwaka and Mwera twice a week.

Selem and Koani are worked in connection with the Government plantations in those districts, and are visited weekly by a Medical Officer, who makes a general inspection and sees any case reserved by the Sub-Assistant Surgeon or Dispenser.

That these dispensaries are of value is, I think, undoubted, and the natives appreciate them. It is to be hoped that in the future, as time and staff allow, they may be made centres of health instruction to the natives.

Zanzibar Maternity Association.

This is a private association controlled by a Committee of Government Officials and private persons, with the Principal Medical Officer as President.

The Government makes a yearly grant of Rs. 4,500. It is undoubtedly a great boon to the town, and the services rendered are appreciated more and more each year.

Below is given the number of cases treated during 1921 and 1922.

Zanzibar Maternity Association.

	Births during 1921.			Births during 1922.		
Nationality	Male	Female	Total.	Male	Female	Total.
Arabs	9	11	20	3	10	13
Comoros	2	4	6	5	1	6
Swahilis	4	7	11	4	7	11
Bohoras	8	8	16	9	14	23
Goans	3	2	5	14	7	21
Hindoos	6	5	11	3	7	10
Khojas	10	9	19	45	38	83
Parsees	—	1	1	2	2	4
Baluchis	1	—	1	—	—	—
Chinese	1	—	1	—	1	1
Greeks	—	1	1	—	—	—
Memons	—	—	—	—	2	2
Seychellians	—	—	—	1	—	1
Kahazaic Moslem	—	—	—	1	—	1
Shihiris	—	—	—	—	1	1
Malay, Cape Town	—	—	—	—	1	1
Total	44	48	92	87	91	178

NATURE OF CASES.

		1921.	1922.
Alive	...	71	157
Died or still-born	...	21	21
Total	...	92	178

TOTAL NUMBER OF VISITS PAID BY THE ASSOCIATION MIDWIVES.

1921.		1922.	
Maternity Visits	1,551	Maternity Visits	2,893
Ante-natal	191	Ante-natal	454
Gynæcological	112	Gynæcological	202
Total	1,854	Total	3,549

B. SPEARMAN,

Acting Principal Medical Officer.

Table I.

Return of Diseases and Deaths (In and Out-Patients) for the year 1922 :—

Diseases.	Europeans.			Natives.		
	Zanzibar and Pemba.			Zanzibar and Pemba.		
	Admissions	Deaths.	Out-patients Attend-ance.	Admissions	Deaths.	Out-patients Attend-ance.
INFECTIVE DISEASES.						
Beri-Beri	..	..	..	1	..	..
Cerebro-Spinal Fever	1	1	..	2	2	..
Chicken-pox	..	..	..	..	..	1
Cholera	..	..	..	..	..	..
Dengue	..	..	..	..	..	..
Diphtheria	..	..	..	..	..	..
Dysentery	1	..	..	17	1	37
Endocarditis-infective	..	..	..	..	..	..
Enteric	1	..	..	5	2	..
Erysipelas	..	..	..	..	..	1
Gonorrhœa	..	..	..	28	..	683
Influenza	20	..	9	98	2	553
Kala Azar	..	..	..	..	..	..
Leprosy—(*a*) Nodular	..	..	..	1	..	4
(*b*) Anæsthetic	..	..	..	..	..	1
Malaria	29	..	8	99	..	85
(*a*) Benign Tertian ..	..	..	..	116	..	431
(*b*) Quartan	1	..	..	2	..	20
(*c*) Sub-Tertian	..	..	..	46	..	923
(*d*) Chronic Malaria ..	1	..	..	8	..	221
(*e*) Blackwater Fever ..	..	..	..	8	1	9
Type Undetermined ..	..	..	..	3	..	..
Measles	..	..	..	..	..	..
Undulant Fever	..	..	..	..	..	..
Plague	..	..	..	..	..	..
Pneumonia	1	..	..	54	13	45
Rabies	..	..	..	..	..	..
Relapsing Fever	..	..	..	..	..	..
Rheumatism (Acute)	1	..	..	3	..	23
Septicæmia	..	..	..	1	1	..
Sleeping Sickness	..	..	..	..	..	..
Small-pox	..	..	..	4	..	..
Syphilis—(*a*) Primary	..	..	..	16	..	214
(*b*) Secondary	..	..	..	4	..	96
(*c*) Tertiary	..	..	..	6	..	113
(*d*) Inherited	..	..	..	2	..	12
Tetanus	..	..	..	1	1	..
Tuberculosis	..	..	..	52	7	81
Whooping Cough	..	..	..	..	..	4
Yaws	..	..	..	19	..	221
,, Tertiary	..	..	..	..	..	125
Yellow Fever	..	..	..	..	..	..
Mumps	..	..	..	..	..	..
Undefined Fever	..	..	17	105	..	980
Other Diseases	..	..	..	1	1	2
INTOXICATIONS.						
Alcoholism	..	..	..	..	..	14
Morphinism	..	..	..	..	..	..
Others	..	..	..	..	..	8
Carried forward ..	56	1	34	702	31	4907

Table I—(*Continued*).

Diseases	Europeans. Zanzibar and Pemba. Admissions	Deaths.	Out-patients Attend-ance.	Natives. Zanzibar and Pemba. Admissions	Deaths.	Out-patients Attend-ance.
Brought forward ..	56	1	34	702	31	4937
GENERAL DISEASES.						
Anæmia	..	..	1	4	..	889
Anæmia-Pernicious	..	..	..	..	..	0
Diabetes	..	..	..	3	..	9
Exophthalmic Goitre	..	..	..	..	..	..
Gout	..	..	..	1	..	2
Leucocythæmia	..	..	..	..	..	..
Hodgkin's Disease	..	..	..	1	..	..
Myxœdema	..	..	..	..	..	..
Purpura	..	..	..	.	..	..
Rickets	..	..	..	..	..	2
Scurvy	..	..	..	..	..	..
Debility	..	..	20	54	2	608
Rheumatism (Chronic)	..	..	14	18	..	1163
Other Diseases	..	..	..	..	..	..
LOCAL DISEASES.						
Sub- Section 1.						
Diseases of the Nervous System.						
Neuritis	..	..	..	8	..	19
Meningitis	..	..	..	..	..	1
Myelitis	..	..	..	1	..	..
Hydrocephalus	..	..	..	..	..	..
Encephalitis	..	..	..	2	..	..
Abscess of Brain	..	..	..	1	1	..
Congestion of Brain	..	..	..	1	1	..
Other Diseases	..	..	..	4	..	..
Sub-Section 2.						
Apoplexy	..	..	..	3	2	1
Paralysis	..	..	..	12	2	28
Chorea	..	..	..	..	..	..
Epilepsy	..	..	..	4	1	7
Neuralgia	..	..	2	8	..	438
Hysteria	..	..	..	3	..	2
Neurasthenia	1	..	..	..	..	..
Vertigo	..	..	..	..	..	11
Other Diseases	..	..	..	9	..	3
Sub-Section 3.						
Mental Diseases.						
Idiocy	.	..	..	..	..	..
Mania	..	..	..	..	..	..
Melancholia	1	..	..	2	..	..
Dementia	..	..	..	1	..	..
Delusional Insanity	..	..	..	..	..	..
Other Diseases	..	..	..	3	..	1
Diseases of the Eye						
Blepharitis	..	..	..	..	..	18
Pterygium	..	..	..	1	..	..
Conjunctivitis	..	..	5	21	..	464
Entropion and Trichiasis	..	..	..	3	..	3
Keratitis	..	..	..	3	..	10
Ectropion	..	..	..	1	..	..
Ulceration of Cornea	..	..	..	6	..	25
Iritis	..	..	..	1	..	17
Trachoma	..	..	..	1	..	9
Carried forward ..	58	1	76	882	40	8657

Table I—(*Continued*).

Diseases	Europeans.			Natives.		
	Zanzibar and Pemba.			Zanzibar and Pemba.		
	Admissions	Deaths.	Out-patients Attend-ance.	Admissions	Deaths.	Out-patients Attend-ance.
Brought forward ..	58	1	76	882	40	8657
Local Diseases—*(Continued)*.						
Diseases of the Eye.						
Panophthalmitis	..	..	..	1	..	..
Optic Neuritis	..	..	..	..	..	3
„ Atrophy	..	..	..	1	..	..
Cataract	..	..	..	17	..	67
Enucleation	..	..	..	1	..	..
Other Diseases	1	..	..	10	..	71
Diseases of the Ear						
Inflammation	..	..	..	1	..	139
Other Diseases	..	..	6	..	..	162
Diseases of the Nose						
Coryza	..	..	7	..	..	240
Other Diseases	..	..	..	..	..	12
Diseases of the Circulatory System.						
Pericarditis	..	..	..	3	1	..
Endocarditis	..	..	..	1	..	7
Myocarditis	..	..	..	1	1	..
Valvular, Mitral	..	..	..	29	3	64
Aortic	..	..	..	..	..	..
Cardiac Dilatation ..	..	..	..	2	..	..
Tricuspid	..	..	..	..	..	..
Pulmonary	..	..	..	..	..	..
Morbus Cordis	..	..	..	2	..	..
Arterial Sclerosis	..	..	..	2	..	..
Varicose Veins	..	..	..	1	..	..
Aneurism	..	..	..	..	..	..
Hæmorrhage Reactionary ..	..	..	..	2	..	..
„ Secondary ..	..	..	..	1	..	..
Other Diseases	..	..	..	1	..	17
Diseases of the Respiratory System.						
Laryngitis	..	..	..	3	1	14
Bronchitis	2	..	20	65	..	2334
Rhinopharyngitis Mutilans ..	..	..	..	1	..	..
Broncho-Pneumonia	..	..	..	1	..	5
Abscess of Lung	..	..	..	..	..	..
Gangrene of Lung	..	..	..	..	..	..
Emphysema	..	..	..	..	..	..
Pleurisy	..	..	..	2	..	14
Asthma	..	..	3	6	..	184
Empyema	..	..	..	1	..	..
Other Diseases	..	..	..	..	..	159
Diseases of the Digestive System.					..	
Stomatitis	..	..	..	10	..	27
Caries of Teeth	....	..	1	..	..	1117
Glossitis	..	..	..	1	..	1
Pharyngitis	..	..	5	..	..	35
Tonsilitis	..	..	1	3	..	241
Gastritis	2	..	1	6	..	116
Pyorrhœa Alveolaris	..	..	..	2	..	..
Ulceration of Stomach	..	..	..	..	..	..
Hæmatemesis	..	..	..	..	..	..
Dilatation of Stomach	..	..	..	..	..	..
Stricture of Stomach	..	..	..	..	..	..
Dyspepsia	..	..	21	1	..	320
Enteritis	..	..	..	2	..	..
Carried forward ..	63	1	141	1062	46	14006

Table I—(*continued*).

Diseases.	Europeans.			Natives.		
	Zanzibar and Pemba.			Zanzibar and Pemba.		
	Admissions	Deaths.	Out-patients Attend-ance.	Admissions	Deaths.	Out-patients Attend-ance.
Brought forward ..	63	1	141	1062	46	14006
Local Diseases—*(Continued).*						
Diseases of the Digestive System.						
Appendicitis	1	..	..	1	..	1
Colitis	1	..	3	13	..	4
Ulceration of Intestines	..	..	..	..	..	..
Sprue	..	..	..	..	..	..
Hernia	1	..		101	..	267
Diarrhœa	..	..	22	13	1	269
Constipation	..	..	49	15	..	3279
Colic	..	..	2	7	..	385
Hæmorrhoids	..	..	2	6	..	34
Pancreatitis	..	..	..	..	..	..
Hepatitis (Acute)	..	..	..	3	..	4
Hepatic Congestion	1	..	15	3	..	455
Abscess (Hepatic)	..	..	..	..	..	..
Cirrhosis (Hepatic)	..	..	..	..	..	21
Jaundice	..	..	..	8	1	17
Peritonitis	..	..	..	5	3	2
Ascites	..	..	..	7	..	11
Fistula in Ano	..	..	..	5	..	1
Other Diseases	..	..	1	6	2	124
Diseases of the Lymphatic System						
Splenitis	..	..	..	5	..	167
Inflammation of Lymphatic Glands ..	..	..	..	3	..	44
Suppuration of do. ..	..	..	..	1	..	2
Lymphangitis ..	..	..	1	8	..	43
do. (Filarial) ..	..	..	..	7	..	21
Varicose Groin Glands ..	..	..	..	4	..	..
Other Diseases ..	..	..	..	..	..	5
Diseases of the Urinary System						
Nephritis (Acute) ..	..	..	..	..	..	3
,, (Chronic) ..	..	..	..	4	..	21
Pyelitis ..	..	..	..	1	..	..
Calculus ..	..	..	..	..	..	..
Renal Colic ..	..	..	..	..	..	..
Cystitis ..	..	..	2	8	2	39
Vesical Calculus ..	..	..	..	..	..	..
Suppression ..	..	..	..	..	..	..
Hæmaturia ..	..	..	..	4	..	27
do. (Bilharzia) ..	..	..	..	..	..	102
Bilharzia ..	..	..	..	17	..	3
Chyluria ..	..	..	..	..	..	..
Retention of Urine ..	..	..	..	2	..	1
Other Diseases ..	..	..	1	2	..	11
Diseases of the Generative System.						
Male Organs—						
Urethritis (Acute) ..	..	..	..	..	..	2
do. (Chronic) ..	..	1	..	1	..	64
Ruptured Urethra ..	..	..	..	2	..	..
Stricture ..	..	..	..	6	..	68
Stricture of Urethra ..	..	..	..	3	..	..
Prostatitis ..	..	..	..	..	..	2
Soft Chancre ..	..	..	..	2	..	51
Hydrocele ..	..	..	..	80	..	288
Varicocele ..	..	..	..	1	..	3
Carried forward ..	68	1	240	1415	55	19847

Table I—(*Continued*).

Diseases	Europeans. Zanzibar and Pemba. Admissions	Deaths.	Out-patients Attend-ance.	Natives. Zanzibar and Pemba. Admissions	Deaths.	Out-patients Attend-ance.
Brought forward ..	68	1	240	1415	55	19847
Local Diseases—*(Continued)*.						
Diseases of the Generative System.						
Male Organs—						
Orchitis	..	..	..	21	..	181
Haematocele	..	..	..	8	..	..
Epididymitis	..	..	..	6	..	78
Lymphatic Varix of Cord ..	..	..	..	6	..	..
Abscess of Testicle	..	..	..	2	..	17
Castration	..	..	..	9	..	..
Lymphatic Scrotum	..	..	..	1	..	..
Other Diseases	..	..	..	4	..	66
Female Organs—						
Ovaritis	..	..	..	..	..	1
Ovarian Cyst	..	..	..	..	..	6
Endometritis	..	..	..	..	..	..
Displacement of Uterus ..	..	..	..	..	..	..
Vaginitis	..	..	..	2	...	5
Amenorrhœa	..	..	..	..	..	5
Dysmenorrhœa	..	..	..	..	..	16
Menorrhagia	..	..	..	1	..	6
Confinement	1	..	..	13	1	3
Leucorrhœa	..	..	..	1	..	2
Abortion	..	..	..	5	..	2
Prolapse of Uterus	..	..	..	1	..	...
Delayed Labour	..	..	..	..	..	3
Postpartum Hæmorrhage ..	..	..	..	..	..	3
Retained Placenta	..	..	..	4	1	..
Premature Birth	..	..	..	..	..	..
Puerperal Septicæmia	..	..	..	..	..	1
Mastitis	..	..	..	...	..	8
Fibroid Uterine	..	..	..	8	..	24
do. Polypus	..	..	..	1	..	..
Abscess of Breast	..	..	..	..	..	5
Vesico-Vaginal Fistula	..	..	..	1	..	..
Other Diseases	..	..	..	4	1	13
Diseases of the Organs of Locomotion.						
Osteitis (Caries and Necrosis) ..	..	...	..	8	..	1
do. Fractures	..	..	..	5	2	..
Arthritis	...	..	..	7	..	15
do. Dislocation	..	...	..	3	..	3
Synovitis	..	..	..	11	..	61
Bursitis	..	..	..	6	..	2
Myalgia	..	..	..	4	..	45
Perineal Abscess	..	..	..	1	..	..
Locomotor Ataxia	..	..	..	2	..	..
Other Diseases	..	..	1	9	1	29
Diseases of Connective Tissue.						
Cellulitis	..	..	..	14	1	102
Abscess	1	..	..	65	1	281
Elephantiasis	..	..	..	34	..	96
Tropical Phagedæna	..	..	..	8	..	..
Cancrum Oris	..	..	..	1	..	..
Other Diseases	..	..	..	1	..	13
Diseases of the Skin.						
Urticaria	..	..	..	1	..	10
Eczema	2	..	7	5	..	162
Carried forward ..	72	1	248	1698	63	21112

TABLE I—(*Continued*).

Diseases	Europeans. Zanzibar and Pemba. Admissions	Deaths.	Out-patients Attend-ance.	Natives. Zanzibar and Pemba. Admissions	Deaths.	Out-patients Attend-ance.
Brought forward ..	72	1	248	1698	63	21112
LOCAL DISEASES—*(Continued.)*						
Diseases of the Skin.						
Boil	..	..	9	6	..	207
Carbuncle	..	..	..	..	..	1
Herpes	1	..	..	3	..	19
Psoriasis	..	..	2	..	..	25
Oriental Sore	..	..	..	..	..	..
Tinea	..	..	1	..	..	82
Tinea Cruris	..	..	2	2	...	74
Scabies	..	..	..	15	..	472
Acne	..	..	..	..	..	..
Prickly Heat	..	..	9	..	..	13
Ulcers	..	..	..	196	..	2879
Thiersch's Skin grafting	..	..	..	2	..	..
Other Diseases	..	..	1	8	..	88
Gangrene	..	..	..	4	3	..
Injuries-General	..	..	..	3	2	1186
do. Local	5	..	10	210	9	1857
Surgical Operations	..	..	..	206	1	103
Amputations	..	..	..	7	..	..
Tumours (Simple)	1	..	..	26	..	29
do (Malignant)	..	..	..	6	1	1
Other Diseases	..	..	..	..	..	..
Malformations	..	..	..	1	..	1
Poisons	1	..	..	..	...	..
Snake-bite	..	..	..	..	..	3
Parasites— Animal	..	..	..	..	..	..
Protozoa	..	..	..	..	..	..
Trematoda (Flukes)	..	..	..	..	..	..
Other Diseases	..	..	..	..	..	..
Cestoda	..	...	...	..	..	1
Tænia Solium	..	..	..	..	..	1
Tænia Saginata	..	..	..	..	..	..
Unclassified	..	..	..	..	..	..
Nematoda—						
Ascaris	..	..	..	29	..	55
Trichocephalus Dispar	..	..	..	..	..	..
Trichina	..	..	..	..	..	..
Dracunculus	..	..	..	..	..	..
Filariasis	..	..	..	35	..	176
do. Filariasis Fever	..	..	..	..	..	..
Strongylus Intestinalis	..	..	..	6	..	..
Ankylostomiasis	..	..	..	346	10	1687
Oxyuris	..	..	..	..	..	..
Other Diseases	..	..	..	..	..	1
Insecta—						
Myiasis	..	..	..	..	..	68
Jiggers	..	..	..	3	..	..
Other Diseases	..	..	..	..	..	5
Total ..	80	1	282	2812	89	31146

FINANCIAL, MEDICAL DIVISION.

Statement of Expenditure and Revenue for the year 1922.

EXPENDITURE.

Details.	Estimated.					Actual.				
	Rs.	cts.		s.	d.	Rs.	cts.	£	s.	d.
MEDICAL.										
Personal Emoluments ..	177,879	00	11,859	0	0	167,817	45	11,187	16	7
Other Charges.										
Fuel and Light ..	5,000	00	303	0	0	5,001	15	333	8	2
Incidental Expenses ..	600	00	40	0	0	039	01	22	12	0
Maintenance of Hospitals ..	26,800	00	1,789	0	0	27.532	30	1,835	9	9
Medical and Surgical Stores ..	30,000	00	2,000	0	0	25,126	21	1,675	1	8
Passages ..	20,000	00	1,334	0	0	16,604	39	1,106	19	2
Rent of Houses and Mwera Dispensary ..	6.030	00	402	0	0	1,308	00	87	4	0
Travelling Expenses ..	800	00	53	0	0	326	18	28	8	3
Total Expenditure ..	267,102	03	17,808	0	0	244,154	69	16,276	19	7
Special Expenditure—										
Furniture and Equipment of District Dispensaries ..	1,800	00	120	0	0	597	00	39	16	0
Typewriter ..	550	00	47	0	0	530	00	35	6	8
Donkey ..	500	00	33	0	0	430	00	28	13	4
Total Exenditure ...	2,850	00	190	0	0	1,557	03	103	16	0

REVENUE.

Details.	Estimated.					Actual.				
	Rs.		£	s.	d.	Rs.	cts.	£	s.	d.
Hospital charges from European and Native Hospitals ..	12,000	00	800	0	0	12,657	67	843	16	11
Total Revenue ..	12,000	00	800	0	0	12,657	67	848	16	11

REPORT ON THE MEDICAL DIVISIONS OF CHAKE CHAKE AND MKOANI, PEMBA,

FOR THE YEAR 1922.

Dr. H. G. Phippen was stationed at Chake Chake from February to August, and Dr. P. L. Craig for the rest of the year.

Throughout the year there was no Nursing Sister.

The number both of out-patients and in-patients show an increase over 1921.

	Chake Chake.	Mkoani.
Out-patients	6,040	2,103
In-patients	369	104

The prevalent ailments have been the same as in former years, viz., malaria, ankylostomiasis, bronchial catarrh, constipation, venereal diseases, ulcers, and local injuries.

Owing to engrossment of the people in harvesting the heavy clove crop, want of continuity in the medical service at Chake Chake and the fact that Weti has become a centre for operations, less operative work has been done here, and that confined, for the most part, to the treatment of injuries and urgent conditions.

Operations were performed under general anæsthesia, and included radical cure of hernia, amputation of elephantoid scrotum, and cystotomy. A few cataract extractions were also done. A number of minor operations were done under local anæsthesia. There were no deaths from operation.

A large number of the cases of ulcers, ankylostomiasis and other minor conditions treated in hospital and discharged when sufficiently well although not absolutely cured, are classed under the heading " relieved."

There has not been much variation in the prevalence of malaria, but there have been more cases of black-water fever; five cases occurring within six weeks in August-September; fortunately none was very severe and all recovered. Ankylostomiasis, for which nothing is yet being done prophylactically, continues to be the cause of many deaths.

Tuberculosis of the lungs seems to be on the increase especially among the Indian population.

During the last quarter of the year there were a considerable number of cases of lobar pneumonia.

Perhaps owing to the abnormal rains during the year there was an increase in the number of cases of bronchial catarrh (true bronchitis is rare) and of chronic rheumatic affections (acute rheumatism is practically unknown).

In the second quarter of the year there were a number of cases of influenza of a mild type.

Throughout the year there was an absence of outbreaks of whooping cough and chicken-pox.

Again, as during last year, there were no cases of typhoid fever or dysentery (either amœbic or bacillary).

There were three small outbreaks of small-pox, with 10 cases and three deaths.

European Officers.—The health of the European officers and their families has been good. None of the five children has had malarial fever while in Chake Chake.

Non-European Staff.—The health of the non-European staff has been fairly satisfactory on the whole. There were 137 attendances in the out-patient department—in 43 instances for malarial attacks. Five were treated in hospital—two for black-water fever, one for lobar-pneumonia, one for bronchitis, and one for hæmatemesis.

Police.—Health good; 125 were treated in the out-patient department, and 14 as in-patients.

Prisoners.—Their health has been good, with no epidemic disease and no death. There were 108 attendances in the out-patient department, and 15 were treated in hospital. The prevalent diseases were malaria, ankylostomiasis, bronchial catarrh, and ulcers.

School Children.—Of 31 examined at random, not complaining of illness, 11 had malarial parasites in the blood, 17 had ankylostoma ova in the stools, and two ascaris ova.

Prophylactic Quinine has been taken regularly by most of the European Officers, and non-European staff, and by all police, prisoners, and school children.

P. L. CRAIG,
Medical Officer.

REPORT ON THE MEDICAL DIVISION OF WETI, PEMBA,

FOR THE YEAR 1922.

General.—Ever since 1916 the need of appointing a second Medical Officer to Pemba has been recognised, but it was not till 1922 that the proposal was carried out.

In November, 1921, Dr. Howard returned from leave, and with Mrs. Howard as Nursing Sister, was posted to Weti to organize the medical work for the northern half of the island, while Dr. Craig remained in charge of the southern half, embracing the Chake Chake and Mkoani districts.

Dr. and Mrs. Howard remained at Weti throughout the year 1922. Hitherto Weti has been a district dispensary, with about eight beds, in charge of a Sub-Assistant Surgeon working under the Medical Officer of Chake Chake. No operative work was possible, and any material for microscopic examination had to be sent through the post to Chake Chake. In 1921 the in-patients numbered 116 and the out-patients 2,637.

The sudden change to a regular hospital was not made without considerable difficulty. It was found possible to crowd 13 beds into the men's wards, while a women's ward of six beds was made upstairs out of part of the unduly large subordinates' ward.

Half of the operating theatre had to be used as the Medical Officer's consulting room and pathological laboratory. The overcrowding in the men's wards was most insanitary, and the continual stream of out-patients in the operating theatre was obviously undesirable, but as a temporary measure it succeeded.

For 1923 a new out-patient building has been sanctioned. This will accommodate the dispensary, dressing room, pathological laboratory, consulting room and store; and the hospital proper will have a spacious ward for 18 male patients, while the theatre will only be used for operative work. When this building is completed there will be the same amount of accommodation in the Weti Hospital as there is at Chake Chake.

The opportunities for medical work in the Weti district were soon manifested. In spite of the disadvantages referred to above the in-patients numbered 251, the new out-patients 6,185, and there were 9,567 repetition cases. Special attention was concentrated on operative work, and 306 operations were performed, being considerably above the previous record established at Chake Chake in 1920.

A large number of the patients were from the Wa-Pemba villages on the east coast, 12 or 14 miles distant. Many of them,

suffering from non-urgent conditions such as hernia, had been waiting several years for an opportunity to get operated on.

Two Dispensers qualified as anæsthetists, after having each given 50 general anæsthetics. As the Medical Officer is busy with the operation all the preliminary instruction in anæsthetics is given by the Sister.

The Hospital Staff has been only slightly increased, and all have worked loyally to cope with the great increase in patients and in operation cases.

Structural Alterations.—Only slight alterations were made to the hospital during the year. An ablution room for the men, which had been inadvertently omitted when the hospital was built, was constructed and a veranda along the front of the building was added.

The large upstairs room, which served as a subordinates' ward, was divided by a partition wall to provide a women's ward. A small mortuary was built at the back of the hospital.

The house for the Medical Officer, situated close to the hospital, which was authorized in August, 1921, was unfortunately greatly delayed in building and was not finished by the end of 1922.

Officials.—The health of the European officers has been remarkably good. No one was invalided and no case of serious illness occurred. This is to be attributed mainly to the regular and conscientious use of prophylactic quinine.

One European baby under a year old when living in the shamba, where her father was engaged on the road survey, had a very severe attack of sub-tertian malaria, but made a complete recovery.

The non-European officials also show a good record. None has been invalided. There were a few cases of malaria, which were treated in quarters, and one severe case of food poisoning which necessitated admission to the subordinate ward.

The health of the prisoners has been remarkably good, only two being admitted to hospital during the year. As usual, prisoners suffering from ankylostomiasis were treated as out-patients on their admission to gaol.

Clinical Observations—Prevalent Diseases.

Malaria.—Little can be added to the facts recorded in the Reports of the last three years as to the prevalence of malaria in Pemba. Chronic malaria with enlarged spleen is general amongst the Indian residents. It is due mainly to inadequate quinine

treatment. In spite of constant advice it seems impossible t induce the Indians to adopt a system of regular prophylact quinine. In the last quarter of the year a number of Zanziba Indians came up seeking their fortune from the clove crop, and a they took no special precautions they suffered severely from malaria As usual prophylactic quinine has been administered regularly t the non-European officials, police, school children and prisoner During the year 3,790 such doses were administered.

Ankylostomiasis.—The regular treatment of all cases that pre sented themselves as out-patients during the last three years ha probably begun to tell, and though the disease is still ver prevalent, and is the cause of much minor ill-health and industria inefficiency, yet comparatively few severe cases are now seen, an there were no deaths among in-patients from this disease.

The examination of a number of Wa-Pemba patients fro the east coast, who were admitted to hospital for operation, showe that amongst them the infection is much milder than with th Swahili of the western side of the island; this is due partly to th better sanitary condition of the Wa-Pemba villages and partly t the much drier and more porous soil of the east coast. The in fection rate of all those whose stools were examined, both in- an out-patients, works out at about 95%. During the year 937 out patients and 178 in-patients were treated. As in previous year Ol. Chenopodii was the drug generally administered and the result continue to be satisfactory.

As regards other intestinal parasites, ascaris was found 5 times, *i.e.*, in 8% of the stools examined, and Strongylu Intestinalis was noted on 27 occasions. It may be remarked tha the habit of earth eating (Geophagy) has been acquired by abou 7.4% of the patients suffering from ankylostomiasis.

Bilharzia.—This disease is prevalent in the district, espe cially amongst the Wa-Pemba; there were 42 out-patients and si in-patients attended for this disease. The lack of sufficien hospital accommodation prevented any proper attempt to cure al cases by means of intravenous injections of Tartar Emetic. Tw patients were satisfactorily treated by rectal injections of thi drug, and one other by this means combined with intramuscula Emetin. It is most desirable that a thorough investigatio should be made by the Economic Biologist to demonstrate th particular species of snail which acts as carrier in Pemba. Onc possessed of this knowledge, and also with some information as t the special habits of the carrier, it might be possible by means o sanitary measures against the snail, combined with discovery an systematic treatment of all patients, to make a real effort to fre the island of this painful and debilitating disease.

Frambœsia or Yaws.—In the southern half of the island early infective yaws is relatively infrequent, while many cases of the late tertiary complications are seen.

In this district, especially amongst the Wa-Pemba, primary yaws is quite common and the infection seems to be spreading. In view of the fact that yaws is so easily curable by modern methods, a regular campaign with a systematic attempt to treat and cure all cases seems called for. At least 500 doses of Neokharsivan, or Glucarsenol, or similar preparations would be required. If no such attempt is made the inevitable result will be that the severe tertiary cases with the characteristic chronic ulceration and periostitis, which leads to so much loss of industrial efficiency elsewhere in Africa, will be constantly occurring in this district for many years to come. This year an attempt was made in the statistics to distinguish between the cases of early and of tertiary yaws; 167 of the former, as against 125 of the latter, were recorded. Of the 167 early cases, 77 were treated and cured by intramuscular injections of Neokharsivan. These injections were given with Novocaine or Eucaine, and they caused little or no trouble, in spite of the fact that many of the patients had to walk 24 or more miles, *i.e.*, to and from their homes on the day of treatment. Many more could have been treated, but the supply of the drug was not sufficient. Other cases were treated with Castellanis mixture, which is much less certain in its results, and, as it has to be continued from week to week, it is probably considerably more expensive in the end than a single dose of Neokharsivan, which costs about Rs. 6.

Ulcers.—As regards ulcers, owing to lack of space, very few could be admitted to hospital, but a number were regularly treated as out-patients till cured.

As is usually the case, Phagedænic ulcers were prevalent in May and June after the rainy season. A number of these were operated on and received all their treatment as out-patients. Altogether 26 such ulcers were scraped under an anæsthetic.

Injuries.—The injuries admitted fall into two categories, firstly, incised wounds due to fighting with knives, which is still fairly common in Pemba, and secondly accidents due to falls from clove trees. Two of the latter proved fatal, one from a fractured base of the skull, and the other from compound fractures of both legs in an old man. All the other cases recovered. The commonest injury is a severe lacerated penetrating wound caused by the sharp end of a dead branch of the tree. These wounds often have pieces of wood still in them, and they require thorough exploration under an anæsthetic.

Operations.—Three hundred and six operations were performed during the year, 201 on in-patients and 105 on out-patients. General anæsthesia was induced 197 times, chloroform being used

158 times, and chloroform æther 39 times; 140 anæsthetics wer given by Dispensers and 57 by the Sister. No case of death unde anæsthetic occurred. The local anæsthetics used were cocain 12 times, novocaine 21 times and eucaine 76 times, a total of 10 cases.

The following is the list of the main operations performed :—

Radical Cure of Hernia (Halstead's Operation)	59
Radical Cure of Hydrocele (Single 15, Double 16, Hæmatocele 6)	37
Castration	9
Amputation of Scrotum (for Elephantiasis 8. for Lymph Scrotum 1)	9
Scraping Phagedænic Ulcers	26
Suture and cleaning of wounds	16
Supravaginal Hysterectomy	5
Removal of Fibroid Polypus	1
Abdominal Section	1
Removal of Tumours (Simple 15, Malignant 1)	16
Cataract Extraction	10
Berlin's Operation for Trichiasis	3
Heisrath's Operation for Trachoma	1
Thiersch's Grafting	3
Wheelhouse External Urethrotomy	3

Several of the herniæ were of many years standing wit thickened sac, the residue of old inflammation. Several cases c sliding hernia of the cæcum were encountered; lymphatic varix c the spermatic cord of filarial origin was found six times. On case of direct hernia contained the bladder in the wall of the sac.

Many of the hydroceles showed evidence of inflammatory origi probably due to filaria, and two showed actual foci of suppuratio in the tissues surrounding the sac. Several cases of primar Hæmatocele of acute inflammatory origin were also observed. I one case the thickening of the sac and surrounding tissues was s great as to appear almost like a sarcoma. In these severe cas castration is necessary.

The simple tumours were similar to those mentioned in th 1920 Report. The only malignant tumour was a recurrent Myx sarcoma of the groin. The original tumour had been removed thr years ago at Chake Chake.

With the exception of the case of double compound fracture c the legs mentioned above, no death occurred after operation.

There are no Out-Dispensaries in the Weti District. A present the patients who present themselves more than suffice to fi the hospital beds, but when the hospital is enlarged it will b advisable to have a district dispensary amongst the Wa-Pemba c the east coast, either at Wingwi or Shenge-juu.

ROBERT HOWARD,
Medical Officer.

Weti, Pemba, February 3rd, 1923.

REPORT ON THE PUBLIC HEALTH DEPARTMENT

FOR THE YEAR 1922.

The work performed by the Public Health Department is under the control of the Medical Officer of Health, and is divided into the following sections :—

I.—Public Health Division, in charge of the Medical Officer of Health. This includes :—

1. Sanitation of the Town and Port of Zanzibar.
2. Sanitation of the Islands of Zanzibar and Pemba.
3. Port Quarantine Service, including charge of the Quarantine Station for Zanzibar, Kenya, Uganda Protectorate and Tanganyika Territory.
4. Suppression of Infectious Diseases.
5. Infectious Diseases Hospital.
6. Bacteriological and Public Health Laboratories.
7. Poor and Leper Asylums.
8. Vital Statistics.
9. Control of Opium.
10. School Medical Service, including :—
    (*a*) Medical inspection of school children.
    (*b*) Charge of the school dispensary and treatment of sick children.
    (*c*) Lectures on hygiene and allied subjects to teachers.

II.—Veterinary Section, in charge of the Veterinary Officer, including :—

1. Central Inspection and Quarantine of Imported Stock.
2. Meat Inspection.
3. Inspection of milch cows, horses, cattle, camels, etc.
4. Charge of the Veterinary Hospital.
5. Investigation, control and treatment of diseases of local stock.

III.—Biological Section, in charge of the Economic Biologist.

1. Research into the protozoal and parasitic diseases of man and animal, and the investigation of insects causing diseases in man, animal and plants in the Protectorate.
2. General Biological Research.

STAFF.

Dr. B. Spearman, Senior Medical Officer of Health, was in charge of the Department throughout the year.

No visits were paid by him to Pemba during the year under review.

Dr. Aders, Economic Biologist, returned from leave on 25th March, 1922.

Mr. Shah Mohammed Khan, Veterinary Officer, returned from leave on 4th March, 1922.

During the absence of the Economic Biologist and Veterinary Officer (on leave), the Senior Medical Officer of Health controlled the work of the Veterinary Department. This occupied a great deal of his time and interfered to some extent with the routine of public health work. Mr. Abdull Ghani Kark, Bacteriological Assistant, afforded valuable assistance in the work of cattle dipping and inspections at Pigaduri Quarantine Station.

Dr. H. Quin, Assistant Medical Officer of Health, arrived, on first appointment, on 28th July, 1922.

Mr. Mohammed Ramazan Dar, Veterinary Assistant, arrived, on first appointment, on 26th June, 1922.

PART I.—SANITARY LAW.

No fresh legislation was enacted affecting sanitation during the year.

PART II.—SANITATION, ZANZIBAR TOWN.

Table I.

The following table shows the routine work done by the 18 Inspectors on the staff during the year 1922 :—

Inspection of premises	3889
General nuisance notices	789
Visits to hotels and boarding-houses	1809
Notices served	67
Godowns inspected	1080
Visits to bakehouses	139
Notices served	—
Visits to dairies and cowsheds	1557
Notices served	34
Visits to foodstalls and markets	2477
Notices served	1
Average number of cesspools oiled weekly	468
Average amount of oil used weekly (gallons)	11
Latrines regularly cleaned	4
Public urinals regularly cleaned	5
Public lands and graveyards regularly cleaned	231
Houses cleaned out and disinfected	68
Cartloads of refuse removed	48711
Rats collected, trapped and poisoned	9995
Pariah dogs destroyed	52
Paupers removed to Walezo Poorhouse	83
Burials of paupers and others carried out	74
Cesspools emptied out	36
Visits to dwelling-houses, etc., for mosquito nuisance	44541
Notices served	350

Water Supply.—The Chem-Chem collecting area was visited at intervals by the Senior Medical Officer of Health and Assistant Medical Officer of Health. Analysis of this water during the year proved satisfactory.

It is hoped that the coming year will see the installation of the new water supply from Bububu. This water, as during the previous year, was subjected to analysis and found satisfactory. Zanzibar Town should in the near future have as good a water supply as any tropical city.

Drainage.—The rains in the latter part of the year were exceptionally heavy and much sand and silt were washed down with constant blockage and flooding. Consequently mosquitoes bred freely in these collections of water, and considerable difficulty was experienced in finding and dealing with these numerous breeding centres.

Cesspool and Privy Pits.—This was dealt with at some length in last year's Report and there are no fresh comments to make. At present this method appears the only feasible one in such a city as Zanzibar. Regular inspections are made and endeavours continued to improve the lighting and ventilation of household privies. The work of registering and fitting proper cement covers to the cesspools scattered throughout the town continues, and the number so registered and oiled weekly increased from 356 to 468.

In the houses occupied by Europeans, where there is no water supply laid on, the bucket system is in vogue. This cannot be described as an ideal system, and it is to be hoped that with the introduction of the new water supply a proper water carriage system, as now installed in some houses, may be put in all the houses of the European community.

Town Refuse Collection and Disposal.—This was continued on the same principle as last year and is fairly satisfactory in its working. Nuisance is at times caused by householders deliberately throwing their rubbish outside instead of into the bins provided. The spring lids of the bins are also still frequently broken by being forced back. All refuse is destroyed by incineration in the central destructor or in the small local destructors.

Owing to the constant rains, a fly plague occurred in July. This was found to be due to the fact that the destructor was unable to deal with the enormous amount of damp rubbish and stable refuse that came in and had to be deposited, in a more or less raw state, on the clinker dump, forming a prolific fly-breeding area. The nuisance was dealt with by increasing the hours of working of the destructor and the amount of dry fuel used. The breeding area was thoroughly dug over and slacked lime dug in. This had the

effect of destroying the pupæ and the nuisance abated considerably, nevertheless the destructor is undoubtedly too near the town and markets and, as mentioned in previous reports, is a nuisance in its immediate neighbourhood by reason of smoke, dust and flies. This unsatisfactory state of affairs will however be remedied by the erection of a modern destructor outside the town.

A small camp Horsfall is being erected as an experiment in the neighbourhood of Kikwajuni, and it will be interesting to note whether this is more effective and economical than the present somewhat primitive rail incinerators used in those parts which the sanitary carts cannot reach by reason of the roughness of the paths.

Dairies and Cowsheds.—It has not yet been found possible to remove the privately owned milch cattle from their present insanitary byres in the town to the Government sheds at Mji Mpia. This is due to the fact that as yet there is no water supply laid on, but this will shortly be remedied, and during the coming year further sheds will be erected capable of holding 75 cattle. During the next and following years therefore all milch cattle should be removed from the town.

Markets.—These are under the control of the Senior Commissioner, but are inspected regularly by the Public Health Department, and one Sanitary Inspector is detailed for daily duty there. As mentioned in previous years, flies are a great pest, but this nuisance should be greatly improved with the removal of the refuse destructor from its present site.

Improvements in the poultry market were effected during the year under review.

Mineral Water Factories.—Regular inspection of these factories was carried out throughout the year and samples analysed from time to time. The new Decree has not been without beneficial effect on the general cleanliness and hygiene of these factories.

Mosquito Preventing Measures.—These were carried on as last year and the greater number of larvæ found were again Stegomyia, which breeds entirely in uncovered water in household vessels, and is due to the carelessness of the householders themselves. In European houses mosquitoes are usually found breeding in the tins of water in which it is necessary to place the legs of meat safes and other food receptacles in order to prevent the ingress of ants.

Owing to the constant rains throughout the year, especially during the latter months, the number of breeding places was greatly increased, and consequently the work of the mosquito brigade became more difficult.

The golf links and the Recreation Park on either side of the Mnazi Moja Road were often flooded for days together and daily inspection revealed the presence of anopheline larvæ necessitating the use of oil. The depression near the cattle trough at the northern or town end of this road was also a constant nuisance from this cause and it was found necessary to fill it in with rubble.

Undoubtedly, too, the rainwater gutterings attached to the eaves of the houses are, in rainy weather, a source of mosquito breeding, and owing to the heights of the houses many of these are inaccessible. As many as possible are being removed, but it is quite impossible to remove the greater number, as the narrow streets would be impassable in the rains owing to the deluge from the roofs, which also does considerable damage to the road surfaces.

The mosquito brigade was strengthened by the formation of an additional section consisting of one Native Inspector and four boys for the native quarter of Ngambo, which hitherto had not been inspected. This led to the finding of numerous collections of larvæ and the natives in this quarter are already beginning to appreciate the necessity of covering their water vessels and doing away with collections of standing water.

The Economic Biologist was in charge of this gang from the time of its recruitment.

The problem of mosquito prevention is dealt with in detail by the Economic Biologist, whose report is appended.

Table II.

Breeding places of various kinds of mosquitoes found in Zanzibar Town during 1922.

Months	Tanks, Cisterns, Drums, Barrels and Earthern Vessels.			Drains and Cesspools			Old Tins, Broken Bottles, etc.			Trees and Plants			Boats, etc.			Swamps and Pools			Mosquito Traps			Total			Rainfall.
1922	S*	C*	A*	S	C	A	S	C	A	S	C	A	S	C	A	S	C	A	S	C	A	S	C	A	Inches.
January ..	18	3	0	2	2	0	6	0	0	0	0	0	0	0	0	0	0	5	27	5	0	53	10	5	0·00
February ..	12	1	0	0	1	0	4	1	0	0	0	0	0	0	0	0	0	1	23	3	1	39	6	2	0·00
March ..	12	1	2	0	3	0	9	3	0	0	0	0	0	0	0	0	1	2	62	14	7	83	22	11	3·84
April ..	21	2	1	1	1	0	4	0	0	0	0	0	0	0	0	0	0	0	30	15	0	76	18	1	2·10
May ..	31	14	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	1	30	4	0	65	21	2	13·00
June ..	40	6	1	2	4	0	6	0	1	1	0	0	1	0	0	0	1	3	17	4	2	67	15	7	3·99
July ..	18	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	19	3	1	1·68
August ..	21	1	0	0	0	0	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	28	4	0	1·33
September ..	19	4	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	21	6	0	1·37
October ..	16	1	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	19	3	0	4·97
November ..	30	3	0	0	0	0	10	6	0	0	0	0	0	0	0	1	0	0	0	0	0	41	3	0	14·36
December ..	15	0	0	1	1	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	18	2	0	7·41
Total ..	253	37	5	6	17	0	56	12	1	1	0	0	3	0	0	1	2	13	189	45	10	509	113	29	

* S—Stegomyia. C—Culex fasciata. A—Anophelinæ.

PART III.—SANITARY SUPERVISION OF THE ISLANDS OF ZANZIBAR AND PEMBA.

The late Principal Medical Officer, Dr. Curwen, paid a visit to Pemba in February and reported at length on the sanitation of Chake Chake.

The Medical Officer of Health, owing to his having to take over the duties of Acting Principal Medical Officer in July and to undertake medical and surgical work, was unable to pay any visits of inspection to Pemba during the year, but such visits were paid to the different out-stations in Zanzibar.

PART IV.—PORT QUARANTINE SERVICE.

In contrast with the previous year, the quarantine work was very light. No mail steamers arrived in quarantine with small-pox or other disease.

A family of Indians from the S. S. " Karoa " was sent by the Mombasa Health Authorities on account of suspected trachoma, and the crews of two dhows were quarantined on account of small-pox, otherwise the quarantine station remained empty throughout the year.

Particulars are given in the subjoined tables of the Port Sanitary and Quarantine Service.

Table III.

PORT SANITATION RETURN, 1922.

	Arrivals			Ships quarantined	Ships claytonised	Passengers landed	Passengers under surveillance	Number of persons vaccinated	Persons placed in quarantine
	British	Foreign	Total						
Steamers —									
January ..	34	8	42	..	..	1155	230	..	...
February ..	27	8	35	..	..	1444	249	..	..
March ..	29	12	41	..	..	1393	241	..	..
April ..	29	8	37	..	..	1944	403	..	6
May ..	25	8	33	..	..	945	299	..	..
June ..	30	9	39	..	..	1168	3	..	..
July ..	29	7	36	..	..	1149	..	..	..
August ..	30	8	38	..	..	1106	..	..	..
September ..	23	8	31	..	..	779	..	..	..
October ..	33	11	44	..	..	2045	18	..	..
November ..	32	7	39	..	..	3677	..	..	..
December ..	27	7	34	..	..	2906	..	..	..
Men of War ..	3	1	4	..	..	..	..	..	..
Total ..	351	102	453	..	..	19711	1443	..	6
Total for 1921 ..	289	72	361	8	7	12837	1397	1984	2012
Dhows —									
January ..	118	55	173	..	..	793	26	874	..
February ..	111	81	192	..	..	952	21	1818	..
March ..	136	119	255	2	2	869	22	2148	43
April ..	121	49	170	..	..	859	16	977	..
May ..	101	12	113	..	..	439	3	302	..
June ..	97	10	107	..	..	381	7	409	..
July ..	119	13	132	..	..	513	..	840	..
August ..	110	14	124	..	..	434	..	958	..
September ..	119	12	131	..	..	488	..	1449	..
October ..	121	11	132	1	1	504	17	1680	3
November ..	124	21	145	..	..	602	..	864	..
December ..	119	20	139	..	..	511	..	764	..
Total ..	1396	417	1813	3	3	7351	312	13083	46
Total for 1921 ..	1521	674	2195	1	1	6940	187	6052	10

Table IV.

Return of persons quarantined during 1922 :—

	Remaining	Admitted	Total	Discharged	Died	Remaining	Largest No. on one day	No. of days station occupied	Remarks.
January ...	10	.	10	10	...	...	10	17 days	Dhow
March ...	...	20	20	20	...	...	20	12 days	Dhow
April ..	...	6	6	6	...	...	6	12 days	s.s. Karoa
Total ...	10	26	36	36	...	...	36		

PART V.—SUPPRESSION OF INFECTIOUS DISEASES.

Small-pox.—Unfortunately, after a quiescent period of some six weeks from the 19th December, 1921, to 28th January, 1922, fresh cases of small-pox occurred, and the disease was again epidemic throughout the year. The total number of cases was 167 as compared with 158 last year. One hundred and twenty-four cases were treated in Gulioni Infectious Diseases Hospital with 43 deaths as compared to 122 with 40 deaths in the previous year. Forty-one cases were segregated in out-districts as compared to 29 last year, of which four died as compared to nine last year.

Two hundred and forty-one contacts were kept under observation at Gulioni Hospital as compared to 243 last year. Six of these developed the disease as compared to 18 last year. Practically all the cases were unprotected by vaccination.

Ten cases in all, which showed marks of vaccination, were admitted with small-pox, but of these ten, seven were persons who had been last vaccinated five years prior to admission. The remaining three all had very mild attacks.

One of these was a Goan clerk in the Health Office, who had been busily engaged in vaccination work. Fortunately he was well protected by vaccination. For three days he had a temperature of 103°F. and then developed a slight but typical discrete small-pox rash. On the appearance of the rash his temperature fell to normal and did not rise again and he made an uninterrupted recovery.

From experience gained in the last two years I feel convinced that the thorough vaccination and re-vaccination of the whole population of the Island will stamp out the disease and that all other measures are secondary. Throughout the year the lymph used was that prepared in the Bacteriological Laboratory in Dar-es-Salaam, and this gave, on the whole, very satisfactory results.

The attached tables give the details of the small-pox cases admitted and vaccinations performed.

The measures adopted to deal with the outbreak and the treatment of cases admitted were fully described in last year's report and were continued during the year under review. A further year's experience of the treatment by permanganate of potash confirms the impression that this treatment is of great use in milder cases, but its benefit is not so striking in those acute cases accompanied by great loss of surface tissue and acute sepsis, although the foul smell and suffering is greatly relieved by placing the patient in long baths of a warm 5% solution of potassium permanganate. Despite this, however, these patients usually succumb to shock and septicæmia. These cases are very pitiable, and there is no disease which produces such horrible and disgusting conditions and no disease which is so easily prevented by such a simple treatment as vaccination.

Other Infectious Diseases.—There was no serious epidemic of other infectious diseases during the year under review.

Influenza.—A mild form of influenza was very prevalent in the latter part of the year. The symptoms were a slight pyrexia averaging from 100° to 102°F. with general malaise and aching. There was remarkable freedom from respiratory complication. Usually a few days' rest in bed with expectant treatment resulted in complete recovery. In all cases coming under the care of Government Medical Officers a search was made for malarial parasites with negative results and quinine was therefore not given. The possibility of the disease being dengue was considered, but the absence of any rash and severe bone and joint pains and the speedy recovery would appear to negative this.

Enteric.—Five cases occurred among natives and were treated in the Native Hospital with two deaths. One case, an Indian, occurred with fatal result, in the practice of a private practitioner. All these cases showed a positive Widal reaction to B. Typhosus.

Another case, a European, was also treated by the same practitioner. This case showed a negative Widal reaction to B. typhosus, but ran a typical paratyphoid course, ending in recovery. Unfortunately, owing to an oversight, no agglutination tests were made with regard to Para A and B.

Another case, an Indian child *en route* from Bombay to Durban, was removed from s.s. " Karoa " and treated in the Native Hospital. Agglutination tests were positive to B. typhosus. The case ended in recovery.

Zanzibar is usually considered free from enteric fevers but, considering the number of Indians constantly going backwards and forwards between Zanzibar and India, it appears obvious that carriers and infected persons must arrive from time to time. The rarity of the disease in Zanzibar Town is, I think, undoubtedly due to its excellent pipe borne water supply which comes from a carefully controlled and protected gathering ground four miles from the town.

Cerebro-Spinal Meningitis.—Three cases, all imported, occurred during the year. One, a European in the employ of the Tanganyika Territory Government Railway, was picked up unconscious in the streets and admitted to the hospital where he died without recovering consciousness. A *post-mortem* examination revealed the cause of death. The other two cases were a Swahili and a Somali off dhows coming respectively from Tanganyika Territory and from Lamu, the diagnosis being in each case made from *post-mortem* findings. In all these cases the diagnosis was confirmed bacteriologically.

Tetanus.—One death was reported by a qualified practitioner as being due to this cause.

Tuberculosis.—The increased number of cases shown in 1922 is due to the fact that all medical practitioners were circularised and requested to notify all cases suffering from tuberculosis as required by Section 26 of the Public Health Decree. The greatly increased number of deaths recorded is probably largely due to the fact that the Death Inspector, in the employ of the Health Office, having been told to keep a keen look out for phthisical cases, reported many cases as such which would otherwise have been ascribed to pneumonia or bronchitis.

The number of specimens of sputum examined for tuberculosis bacilli was 166 as compared with 128 last year, and of these 50 were positive as compared with 40 last year.

In last year's report the question of tuberculosis was dealt with, and there is nothing further to be reported on that subject.

Ankylostomiasis.—As mentioned last year, this disease takes a heavy toll of suffering and invalidism. Unfortunately it is not possible to record that further preventive treatment or propaganda work has been instituted during the year, as the serious shortage of the medical staff during the greater part of the year left no time for anything but routine and essential work. It is, however, necessary that a knowledge should be instilled into the native mind as to the causes and prevention of this disease, and it is hoped that with more normal conditions obtaining, it will be possible to devote time and energy to propaganda work by means of lectures and the distribution of pamphlets in the vernacular. Forty-nine per cent. of all stools and 72% of prisoners' stools examined were infected with ankylostome eggs as compared with 65% and 70% last year.

Malaria is endemic throughout the Zanzibar Protectorate. From evidence collected it seems as if certain areas in the Islands were more malarial than others. It has been suggested that where the *A. funestus* incidence is high the malaria incidence is also high, on the other hand where *A. costalis* infestation is high the malaria incidence is low. This question has been commented on in the Economic Biologist's report attached hereto. From the returns of the Bacteriological Laboratory it will be seen that benign tertian is the commonest, then subtertian, while quartan is practically negligible. In groups of adult Africans the parisitæmia was slight, but of young Africans high. It was noteworthy that in both these groups the gametocyte rate was low.

It is intended during the forthcoming year to select an area heavily infected with *A. funestus* for an accurate malarial survey. In Zanzibar Town, owing to the scarcity of anophelinæ, the rate of malarial infection is low, and those captured, both adults and larvæ, all proved to be *A. costalis*.

In the report of the Assistant Medical Officer of Health on the School Medical Service it will be noted that the spleen and malaria parasite rate in the children is high, namely, 20% and10% respectively of all examined. But these children, especially the Indian and Arabs, spend a great deal of their time outside the town, and there contract infection.

Table V.

Number of persons vaccinated during the year 1922 :—

	Town	Steam-ships	Dhows	Prison Island	Mwera	Chwaka	Mkokotoni	Total
January ...	642	9	874	00	00	00	165	1690
February ...	838	15	1818	00	115	00	76	2862
March ...	994	22	2148	00	14	00	188	3366
April ...	1275	103	977	00	00	00	180	2535
May ...	509	52	302	00	379	00	118	1360
June ...	803	4	409	00	752	00	110	2078
July ...	1720	3	840	00	948	00	765	4276
August ...	462	0	958	00	180	00	123	1723
September ...	535	0	1449	00	35	486	475	2980
October ...	324	2	1680	00	00	00	790	2796
November ...	691	0	864	00	00	00	700	2255
December ...	377	47	764	00	112	150	40	1490
Total ...	9170	257	13083	00	2535	636	3730	29411

Note:—Out of 9,170 vaccinations performed in town 6,186 were positive, 2,596 negativ and 388 unknown.

The exact result of the vaccinations performed in the districts could not b ascertained this year, but there is no doubt that over 50% proved positive.

Table VI.

SMALL-POX.

On steamers and dhows in harbour	5
Town districts	81
Developed among contacts in Segregation Camp ...	7
Mwera District	32
Chwaka District	19
Mkokotoni District, including Tumbatu Island ...	23
Total ...	167

Ages.		Nationalities.	
Under 1 year	1	Swahili	113
1 to 5 ,, ...	4	Arab	12
6 to 10 ,, ...	9	Gazija	11
11 to 20 ,, ...	31	Shihiri . ..	7
21 to 30 ,, ...	69	Somali	6
31 to 40 ,, ...	48	Memon	4
41 to 50 ,, ...	4	Ithnasheri Khoja	4
51 to 60 ,, ...	1	Kumbaro	3
61 to 70 ,, ...	0	Mnyamwezi	2
		Manyema	1
		Kikuyu	1
		Kharwa	1
		Ismaili Khoja	1
		Goan	1
Total ..	167	Total ..	167

Table VII.

Table showing particulars of deaths due to Small-pox, of which there were 54.

Ages.		Nationalities.	
Under 1 year	1	Swahili	35
1 to 5 ,, ...	1	Arab	6
6 to 10 ,, ...	1	Gazija	5
11 to 20 ,, ...	8	Shihiri	3
21 to 30 ,, ...	21	Memon	2
31 to 40 ,, ...	20	Ithnashiri Khoja	1
41 to 50 ,, ...	2	Mnyamwezi	1
51 to 60 ,, ...	0	Somali	1
61 to 70 ,, ...	0		
Total ..	54	Total ..	54

Of these 35 were males and 19 females.

PART VI.—INFECTIOUS DISEASES HOSPITAL.

The attached table gives the number of cases treated. The hospital is under the control of a Dispenser with a staff of natives. Visits were paid regularly by the Assistant Medical Officer of Health.

The erection of the thresh disinfector was completed in the first month of the year. At first some trouble was experienced in getting it to work satisfactorily, but this being overcome it has since proved effective.

The incinerator, which had practically fallen to pieces, was rebuilt by the Public Works Department and is now working well.

Table VIII.

Table showing particulars of cases treated in Gulioni Infectious Diseases Hospital.

Ages.		Nationalities.	
Under 1 year	1	Swahili	70
1 to 5	4	Arab	12
6 to 10	9	Gazija	11
11 to 20	24	Shihiri	7
21 to 30	49	Somali	6
31 to 40	32	Memon	4
41 to 50	4	Ithnashiri Khoja	4
51 to 60	1	Mnyamwezi	2
61 to 70	0	Kumbaro	3
		Manyama	1
		Kikuyu	1
		Khorwa	1
		Ismaili Khoja	1
		Goan	1
Total	124	Total	124

Of these 83 were males and 41 females.

Table IX.

Table showing particulars of deaths due to Small-pox in Gulioni Infectious Diseases Hospital.

Ages.		Nationalities.	
Under 1 year	0	Swahili	28
1 to 5	0	Arab	6
6 to 10	0	Gazija	4
11 to 20	6	Shihiri	3
21 to 30	19	Memon	1
31 to 40	16	Mnyamwezi	1
41 to 50	2		
51 to 60	0		
61 to 70	0		
Total	43	Total	43

Of these 29 were males and 14 females.

Table X.

DISEASES.	1921.		1922.		REMARKS.
	Cases.	Deaths.	Cases.	Deaths.	
Beri-Beri ...	...	1	1	...	
Black-Water Fever ...	5	3	...	3	
Cerebro-Spinal Meningitis ...	...	...	3	3	
Dysentery ...	...	1	4	2	
Influenza ...	...	...	52	5	
Leprosy ...	13	12	13	8	
Pneumonia ...	25	24	39	46	
Tetanus ...	...	2	...	1	
Tuberculosis ...	...	48	79	163	
Typhoid Fever ...	...	...	7	4	
Variola ...	158	56	167	54	11 occurred in districts.

TUBERCULOSIS:—Deaths certified by qualified Physicians .. 22
Cases reported by do. do. .. 27

Infectious Diseases Hospital.

Table XI.

Diseases	Admitted	Discharged	Died	Remaining
Small-pox ..	124	78	43	3
,, Contacts ..	241	240	..	1
Chicken-pox ..	5	5	..	..
Total ..	370	323	43	4

PART VII.—BACTERIOLOGICAL AND PUBLIC HEALTH LABORATORIES.

The total amount of work done in the Laboratory is rather more than last year. The details are given in the subjoined table.

A considerable number of samples of condensed milk were examined at the request of the Chief of Customs for the percentage of fat.

In two cases of suspected poisoning, the stomachs and their contents were examined for arsenic with negative results.

Thirty-four per cent. of all blood films and 16% of blood films of prisoners were positive for malaria.

Table XII.

BACTERIOLOGICAL LABORATORY RETURN FOR THE YEAR 1922.

Blood

1864

	Positive	Negative
Trypanosomes ...	0	2
Filaria ...	8	19
Spirochætæ pallidæ ...	1	3
Kala zar ...	...	...
Bacilli pestis ...	0	1
Hæmaglobin ...	0	1
Differential Counts ...	7	0
Arneth Counts ...	...	...
Widal's Test ...	7	18
Wasserman's ...	45	36

Malaria	Und ned	St.	Bt.	Q.	
	41	125	250	6	1294

Urine

199

	Positive	Negative
Sugar ...	14	2
Albumin ...	5	7
Casts ...	55	13
Bilharzia ...	9	10
Uric Acid estimation ...	8	0
Catheteral Examination ...	...	...
B. Coli ...	8	1
Others:—	13	0
Urethral discharge Gonococci ...	17	33
Diazo Reaction.	3	1

Faeces

1402

	Positive	Negative
Amœbæ ...	13	36
Ankylostoma ...	693	484
Ascaris ...	104	51
Tænia ...	1	0
Other Parasites ...	6	0
Pus ...	...	...
Blood ...	...	...
B. Shiga ...	...	2
Cultural Examination ...	...	...
Giardia intestinalis ...	3	0
Bilharzia mansoni ...	4	5

Sputum

205

	Positive	Negative
Tubercle Bacilli...	50	116
Pneumo Cocci ...	17	4
Micro Cocci catarrhalis ...	4	0
Cultural Examination ...	...	...
Others ...	...	...
Throat swabs for diphtheria ...	...	...

Nasal Secretions

31

	Positive	Negative
Leprosy ..	13	18

Mantoux

3611

B pestis Pos.	B pestis Neg.
	3611

Miscellaneous

Pos.	Neg.

Vaccines

25

	Number
Staphylococci ...	4
Streptococci ...	2
Gonococci ...	2
B. Coli ...	
Shiga ...	...
Catarrhalis ...	2
Pyorrhœa ...	5
Others ...	2
Acne mixed ...	3
Pyocyaneus ...	1

Chemical

135

	Number
Milk ...	58
Water and ærated waters ...	21
Foodstuffs ...	...
Drugs ...	16
Beverages ...	3
Tinned Provisions	5
Minerals ...	16
Legal Cases ...	13
Others ...	1
Intestinal organs for Arsenic ...	2

Pathological Examination

3

Malignant	Innocent
1	2

PART VIII.—SCHOOL MEDICAL SERVICE.

The School Medical Service was conducted during the year on ne lines indicated in the Medical Officer of Health's Report for 921, but the arrival of an Assistant Medical Officer of Health in he latter half of the year enabled an extension to be effected, so as o include for the first time the Sir Euan Smith Madressa. It is to e regretted, however, that owing to the Medical Officer of Health aving been obliged to act also as Principal Medical Officer, it was ound possible to devote only three half-days weekly to school work. A new School Medical Inspection Form, modified from that pproved by the English Board of Education in order to suit local equirements and providing for four complete medical surveys luring the pupil's school life, was brought into use.

The number of pupils medically inspected during the year was 519, all boys. A return of primary schools in 1921, furnished by he Director of Education, shows that there were on the rolls of such schools in Zanzibar Town,

Boys,	1,158
Girls,	658

These figures must, of course, fall far short of the number of children of school age in the town, while girl pupils have not so far been reached by the School Medical Service, a defect which it is hoped to correct in the future.

The boys examined were divided as follows :—

TABLE I.

	Indians	Arabs	Swahilis	Others*
Government Central School	73	127	72	60
Sir Euan Smith Madressa	287	—	—	—

* *i.e.*, Persians, Comorians, Somalis, etc.

TABLE II.

For this purpose the Government Central School and the Sir Euan Smith Madressa are combined, the pupils being dealt with by races, showing the defects detected :—

	Indians.	Arabs.	Swahilis.	Others.
Number examined	360	127	72	60
Cleanliness—Skin Disease	25	11	5	3
Head Nits	38	2	—	1
Body Dirty	73	6	1	3
Teeth Defective	39	16	5	5
Nose and Throat	4	1	—	—
Tonsils	45	8	4	4
Adenoids	18	2	—	—
External Eye Disease	13	1	1	1
Vision Defective	75	25	10	9
Ear Disease	5	—	1	—
Hearing Defective	21	—	—	—
Speech Defective	3	—	—	1

Table II—(*continued*).

	Indians.	Arabs.	Swahilis.	Others.
Heart and Circulation	11	4	1	2
Lungs	40	3	1	1
Nervous System	1	—	—	—
Rickets	7	3	1	—
Deformities	9	—	—	—
Lymphatic Glands	13	2	3	3
Enlarged Spleen	55	40	18	13
Other Disease or Defect	6	1	—	1
Blood, M.P. present	33	11	7	5

Table II. (*a*)

Noteworthy features of this table are:—

(1) The greatly superior physical picture presented by the Swahili boys.

(2) The high proportion of dental and visual defects among the Indians and Arabs.

(3) The strikingly high incidence of respiratory affections among Indian boys. A few of these cases appeared to be tuberculosis clinically, and will be followed up, with periodical examinations of sputa, this year

(4) The fact that, although the percentage of those having malaria parasites in the blood is fairly level (9-10 per cent.) for the three numerically predominant races, yet, while the Arabs show 31% with enlarged spleens and the Swahilis 25%, the Indians have only 15%. Of children under 10 years of age at the Sir Euan Smith Madressa, eight, *i.e.*, 9.8 per cent., had enlarged spleens, while nine, *i.e.*, 11.1 per cent., showed malaria parasites in the blood.

(5) The want of cleanliness in Indian children is lamentable. No fewer than 72 little Swahilis have to be examined before discovering the dirty body that can be found among five Indians, while the same number of Swahilis will be unsuccessfully searched for the lice eggs present in nine or ten Indians.

(6) Naso-pharyngeal defects are highest among the Indians, who give 18.6% to 8.6% for the Arabs, the next highest. The cases for the most part are not very severe.

(7) The improvement in the Arab children as compared with 1921 may fairly be attributed to the services of the school dispensary and the practice of open-air games and exercises which are now a feature of the Government School. In subsequent notes the Sir Euan Smith Madressa will be treated separately as a homogeneous unit calculated to offer a trustworthy picture of Indian boys in Zanzibar Town. The skin diseases found were acne, scabies, impetigo, seborrhœa, eczema, and ringworm. External eye disease included blepharitis, conjunctivitis, opacities, squint, and nystagmus. Nasal obstruction was present in five cases and otorrhœa in six. The deformities discovered were epicanthus, naevus, supernumerary and webbed digits, hydrocephalus, hare lip and cleft palate, genu valgum and gross obesity. It will be noticed that rachitic affections are few. Under "Other disease or defect," come hernia, orchitis, balanitis (non-venereal), flat foot in Indians, filarial swellings, bilharziasis, and ankylostomiasis, while "Heart and circulation" comprise 10 cases of anæmia, seven of valvular disease, and one apparently functional tachycardia. It is probable that many of the cases of anæmia are due to hookworm disease, and it is hoped to carry out a systematic investigation as to the prevalence of this parasite among pupils.

Defective Vision.—It will be seen that nearly 20 per cent. of the total suffer from defective vision, and that, while this percentage remains constant for Indians and Arabs, it sinks to about 14 per cent. for Swahilis and others. As would be expected this defect bulks more largely in the statistics after the age of eight, *vide* the following table from the Sir Euan Smith Madressa.

TABLE III.

Age	Total No.	No. having defective vision
6— 8	36	2
8—10	45	6
10—12	72	18
12—14	72	16
14— -	62	13

While school work tends to increase visual defects in all countries, in Zanzibar the pupils are further handicapped by the dark, unventilated tunnels which are the homes of the majority of them. Moreover, in most of the schools the desks compel a bad posture, while another factor is doubtless to be found in the books used; the Arabic character, especially, should be very clearly printed with a strong contrast between the ink and the paper, otherwise the eyes are subjected to a severe strain.

Growth and Nutrition.—The subjoined table, showing the average height and weight of the principal races in different age-groups, may be of interest. A further column gives British elementary school boys, not for the purpose of comparing what may not strictly be comparable, but to afford easy reference to a familiar pattern. No Arab boys under eight, and no Swahilis under 10 years, came up for examination. The height is in inches and the weight in pounds.

TABLE IV.

	Indians.		Arabs.		Swahilis.		British.	
Age Group	Height.	Weight.	Height.	Weight	Height.	Weight	Height.	Weight.
6- 8 years	43·8	38·2	..	..	..	.	45·6	49·6
8-10 years	47·5	45 4	49·1	51·1	..	..	49·5	60 9
10-12 years	50·8	52·4	50·8	57·0	52·3	64·1	53 4	72 6
12-14 years	55·3	67·5	55·0	66·9	57·0	76·5	57·7	83.7
14-16 years	60 9	87·2	60·4	89·9	60·1	93·5	61·9	104·5

At the Sir Euan Smith Madressa, nutrition was "good" in only 43.5 per cent. of the boys, while it was defective in the high percentage of 20.2.

Intelligence.—The 287 boys examined at the Sir Euan Smith Madressa were classified as under :—

Backward	...	...	4
Dull	...	...	32
Average	...	...	164
Bright	...	...	87

No child was found to be mentally defective. Although no systematic intelligence test, such as the Stanford Binet, was employed, the conclusions having been drawn from questions and conversation with the pupils during his medical examination, supplemented by information from the head teacher, it is believed that they are substantially just. If time allows the matter will be further investigated but a difficulty is the amount of time which intelligence-testing requires. The question may be of great importance; for instance, in the Transvaal Education Department's Report on the Medical Inspection of Schools in 1920, quoted in the Tropical Diseases Bulletin of October, 1922 (Sanitation Supplement, p. 168), the statement appears that "the general mentality of the second generation of a malarious family is usually very low, feeble-mindedness being common where malaria is prevalent". The implications for inhabitants and administrators of a highly malarious country would be somewhat disconcerting. Hence, an attempt was made among the boys of the Sir Euan Smith Madressa to ascertain what influence, if any, malarial infection might be credited with in retarding mental development. These boys are all Indians—Khojas, Hindoos and a few Parsees—of all social grades and practically all represent the second, or later, generation of families living within the Zanzibar Protectorate; the few exceptions hailing also from malarious countries. Malarial infection, at one time or another, may thus be presumed in the parents, though the intensity and chronicity of the infection remain problematical. Nevertheless, the study is offered for what it may be worth.

For this purpose, then, defects actually discovered and which might be held to hinder the growth of a child's intelligence were grouped as follows :—

Group A. Naso-pharyngeal causes, *e.g.*, enlarge tonsils, adenoids, etc.
,, B. Malarial infection.
,, C. Defective vision.
,, D. Defective hearing.
,, E. Defective nutrition.
,, F. Possibly relevant developmental defects, *e.g.*, cranial abnormality.

The details given below (Table V) were then obtained. In this table, those having any of the above defects are divided according to whether each group defect was alone or was combined in the same individual with one or more of the other group defects; for example, A x C under B x means that that pupil has malarial infection together with a naso-pharyngeal defect and defective vision, and so will be found in the A x column as B x C and in the C x column as A x B, and a solitary C in the D x column signifies defective hearing and defective vision in the same pupil, and will correspond with a D in the C x group.

Table V.

Defect-Groups.

Inteligence Group.	No.	No. having Defect.	A.		B.		C.		D.		E.		F.	
			Alone	+	Alone	+	Alone	+	Alone	+	Alone	+	Alone	+
Backward..	4	4	1	Nil	1	D+E+F	1	Ni	Nil	B+E+F	Nil	B+D+F	Nil	B+D+E
Dull ...	32	20	2	B+C, B,E,F, E,F, C+E.	2	C,C,A, A+C, C+E, C.	3	B,B, A+B, B, A+E, B+C	Ni	Nil	2	A,A, A+C, B+C.	Nil	A,A,
Fair ...	164	95	13	F,B+E, B,B,B, B,E, E,C, C+E.	15	C,C,E, E,E, A+E, A,C, E,A, A,C,C, A,C+E, C,C.	21	B,B,D, B,E,B, B,B+E, B,A+E, A,B.	1	C.	18	B,B,B, A+B, B,C, B+C, A,A, A+C.	2	A,
Bright ...	87	41	5	E,E, B,B, C+D, C+E, D.	9	E,C,A, A,E+D, C, C+E.	6	B,A+D, A+E, B, B+E.	1	A+C, B+E, A.	7	A,A,B, B+D, A+C, B+C.	1	Nil,

TABLE VI.

Intelligence Group.	No.	Having one or more of above defects.	Per cent.	Having malaria alone.	Per cent.
Backward ..	4	4	100	1	25
Dull ..	32	20	62.5	2	6·25
Average ..	164	95	57·9	15	9·1
Bright ..	87	41	47·1	9	10·3

The percentages obtained from this detailed table are shown in Table VI. This would appear to show that the other defects have more influence in retarding intelligence than has malarial infection. The number of "backward" pupils is too small for generalisation, unless their very fewness may be regarded as an argument against the view that the posterity of malarious families must be of low mentality. Upwards of 30% of "bright" boys and only 1.3% of "backward" represent a very satisfactory distribution. It is possible that malaria is often credited with the lethargy which is in reality due to the hook-worm.

At any rate, the whole question is worthy of further investigation.

Vaccination.—The state of the schools as to vaccination was as follows :—

	Good.	Fair.	Unvaccinated.
Government Central School	141	150	39
Sir Euan Smith Madressa	137	118	32

Nearly half of the unvaccinated are protected by previous small-pox. Sixty-three primary and re-vaccinations were successfully performed.

Government Central School Dispensary.—The work done during the year is shown below :—

TABLE VII.

Number of cases treated at the Government School Dispensary during the year 1922.

Abscess	...	...	2
Boils	...	...	25
Bronchial-Catarrh	...	...	152
Constipation	...	...	291
Diarrhœa	...	...	7
Fever	...	...	8
Jiggers	...	...	62
Rheumatism	...	...	26
Ringworm	...	...	21
Orchitis	...	...	4
Scabies	...	...	26
Sprains	...	...	11
Ulcers	...	...	176
Whitlow	...	...	5
Minor Diseases	...	...	168
Total		...	984

In addition, several cases were referred to the Government Hospital. A Sub-Assistant Surgeon attends at the school dispensary twice weekly, but the establishment of a school clinic, which will be served by the Assistant Medical Officer of Health, where free treatment will be available for all necessitous school children and for teachers, is now on its way.

School Buildings.—With the exception of the new Government School, not yet completed, no school building in Zanzibar was designed for that purpose, nevertheless an inspection of the various schools revealed, on the whole, a better state of affairs than was anticipated. The commonest faults observed were :—

(1) Absence of playground. The children play in the streets.
(2) Insufficient latrine accommodation.
(3) Drinking-water; usually an earthern vessel with only one mug.
(4) Infrequency of cleansing and rarity of disinfection of school premises.
(5) Almost perpendicular wooden stairs leading to upper floors.
(6) Desks of bad pattern, enforcing faulty posture, giving no support to the back, and wrongly placed in relation to the light.
(7) Absence of through ventilation in classrooms.
(8) Window area inadequate and rooms dark.
(9) If the English Education Department's requirement of 10 sq. feet of floor-space per scholar be accepted, overcrowding, though it exists, is infrequent, but in Zanzibar it would be better to call for, at least, 15 sq. ft. Few of the classrooms inspected provide the latter space.

The Government Central School, the Bohora Boys' and Girls' School and the U.M.C.A. Boys' School are the most satisfactory from the sanitarian's point of view. The Sir Euan Smith Madressa would benefit greatly by the acquisition of the adjoining unoccupied ground as a playground. The Shia Imami Ismailia Khoja Council's Boys' and Girls' Schools have scarcely a commendable feature, but it is understood that the Council contemplates the erection of new schools and it is to be hoped that this wise intention will be carried into effect as soon as possible.

The worst school inspected was the Memon Boys'—one room, reached by a steep wooden stair, over-crowded, ill-lighted, furnished with backless benches, without sanitary accommodation and without a playground. The community is said to be poor.

It has to be acknowledged that the managers of the different communities' schools showed themselves very ready to receive suggestions and advice.

The Koran Schools are, of course, too bad for comment. A representative one, in Mkunazini, is a damp, dirty ground-floor room, with blackened walls and dusty shelves, on which repose unsearchable bundles. The street door alone furnishes light and air inefficiently, and an inner door leads to darker caverns. On the grimy mats squat 30 children in an area of 100 sq. feet, and here they spend five hours daily.

Instruction in Hygiene.—The lessons in elementary physiology and hygiene for teachers have been continued. The class meets weekly at the Health Office and the lectures are illustrated by specimens, microscopic preparations, diagrams, etc. The aim is to impart simple and practical but sufficient instruction which the teachers will be able to assimilate and subsequently infuse into their pupils.

Conclusion.—It is from the school in Zanzibar that routine habits of hygiene and cleanliness will most surely and speedily percolate amongst a population now dirty, neglectful, and ignorant. The School Medical Service will soon, it is hoped, be reinforced by a school nurse—a project already favourably viewed by the Educational Council of the Protectorate—and the right woman will have access to the houses and the women, to whom she will impart ideas of sanitation and cleanliness, infection and prevention, the care of children, their feeding, the unloveliness of lice, the management of minor troubles and the warnings of graver ones, things of which they now know nothing, and, developing logically, it will involve a more dependable registration of births and a stricter enforcement of compulsory education. Co-operation with the school authorities will ensure that the school itself shall present "an object lesson of cleanliness, brightness, good taste, and of scrupulous regard for all sanitary demands" (Kenwood). In this way the pupil will acquire ideas which will become second nature to him, and which he will carry into his home. He will become the father of the man, an Apostle on the baraza; for it may be assumed that the Zanzibar child is not unmoved by childhood's universal urge to uplift its parents nearly to its own level.

H. C. QUIN,
Assistant Medical Officer of Health.

PART IX.—POOR AND LEPER ASYLUMS.

These are situated at Walezo, four miles from Zanzibar, under the charge of the Roman Catholic Mission. At the beginning of the coming year the lepers will be removed to Funzi Island, off Pemba.

Table XIII.

Walezo Leper Asylum, Zanzibar.

Particulars	Males	Females	Total
Remaining on 1st January, 1922 ...	27	45	72
Admitted during the year ...	5	8	13
Discharged „ „ „ ...	...	...	...
Died „ „ „ ...	3	5	8
Escaped „ „ „ ...	1	1	2
Remaining on 31st December, 1922 ...	28	47	75

Leper Settlements, Pemba.

Particulars	Nduni	Kengeja	Pujini
Average monthly numbers ...	33	23	47

Walezo (Sick) Poorhouse.

The following table shows the number of paupers treated at the Walezo Poorhouse during the year 1922:—

Table XIV.

Particulars	Males	Females	Total
Remaining on 1st January, 1922 ..	39	33	72
Admitted during the year, 1922 ..	115	66	181
Died do. do. ..	47	34	81
Discharged do. do. ..	66	16	82
Escaped do. do. ..	8	8	16
Remaining at the end of the year ..	33	41	74

Table XV.

Population of Zanzibar and Pemba—Census 1910.

		Males	Females	Children	Total
Zanzibar:					
Zanzibar Town	... ...	15,122	14,304	5,396	34,822
Mwera	... ...	11,239	13,206	4,656	29,101
Chwaka	... ...	5,617	7,458	4,553	17,628
Mkokotoni	... ...	11,013	14,242	6,818	32,073
	Total ...	42,991	49,210	21,423	113,624
Pemba:					
Chake Chake	... ...	10,757	13,597	8,958	33,312
Weti	... ...	11,416	11,002	8,307	30,725
Mkoani	... ...	6,290	7,295	5,487	19,072
	Total ...	28,463	31,894	22,752	83,109
	Grand Total ...	71,454	81,104	44,175	196,733

Births.

(*a*) The total number of births registered in the Town of Zanzibar during the year 1922, was as follows:—

Males	... ...	251	
Females	... ...	230	
		——	481
Still-born	... ...		47
			528

(*b*) Nationalities of births:—

Ismaili Khoja	... ...	81	Parsee	... ...	4
Ithnasheri Khoja	... ...	74	European	... ...	3
Hindu	... ...	64	Baluchi	... ..	3
Bohora	... ...	60	Persian	... ...	3
Arab	... ...	57	Myao	... ...	3
Goan	... ...	31	Mnyamwezi	... ...	2
Other Mohammedan Indian	...	31	Chinese	... ...	1
Swahili	... ...	23	Mzaramo	... ...	1
Memon	... ...	18	Manyama	... ...	1
Gazija	... ...	12	East Indian	... ...	1
Other African	... ...	10	Seychellian	... ...	1
Shihiri	... ...	10	Somali	.. ...	1
Mnyassa	... ...	6			481

(*c*) Births registered in the Island of Zanzibar, 1913-1922.

Table XVI.

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
Town Area ...	576	401	332	296	305	418	341	473	479	481
Mkokotoni District ...	634	511	1023	1099	1559	930	720	1573	986	1090
Mwera ,, ...	287	245	426	490	430	479	313	313	513	459
Chwaka ,, ...	253	190	458	469	392	384	402	600	613	628
Total ...	1750	1347	2239	2354	2686	2211	1776	2959	2591	2658

(*d*) Comparative statement of Births and Deahts, 1913-1922.

Table XVII.

		1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
Town Area	Births ...	576	401	332	296	305	418	341	473	479	481
	Deaths ...	1128	1317	1008	1168	1255	1359	1180	1083	1076	1262
Districts	Births ...	1174	946	1907	2058	2381	1793	1435	2713	2112	2177
	Deaths ...	1983	1821	2212	2089	2235	2515	1983	1958	2185	2195

Deaths.

(*a*) The total number of deaths registered in the Town of Zanzibar during the year 1922 was as follows :—

Males	650
Females	612
Total ...	1262

(*b*) Nationalities of the deceased :—

Swahili	677	Goans	7
Gazija (Comoro)	83	Unknown	6
Shihiri	67	Manyema	4
Other Indian Mohammedan ...	59	Mnindi	4
Arab	57	Mgindo	3
Ismaili Khoja	53	Persian	3
Ithnasheri Khoja	51	Parsee	3
Hindu	41	Mbissa	3
Bohora	25	Ndigo	2
Mainland Native	18	Kavirondo	2
Memon	17	European	1
Baluchi	15	Abyssinian	1
Somali	15	Makua	1
Mnyassa	13	Mnubi	1
Mnyamwezi	11	Seychellian	1
Mzaramu	9	Mganda	1
Myao	8		
		Total ...	1262

Table XVIII.

Return of general causes of deaths in Zanzibar Town, during 1922.

Diseases	Reported by		Total.
	Qualified Practitioners.	Unqualified Persons.	
Infective Diseases.			
Influenza	5	...	5
Diarrhœa	1	16	17
Dysentery	2	...	2
Erysipelas	1	1	2
Leprosy	8	...	8
Malaria Fever	16	53	69
Black-water Fever... ...	3	...	3
Enteric Fever	4	...	4
Pneumonia	23	9	32
Septicæmia	1	1	2
Small-pox	49	...	49
Syphilis	2	1	3
Tetanus	1	...	1
Tuberculosis	22	141	163
Hydrocephalus with convulsions	1	...	1
Undefined Fever	1	...	1
Encephalitis	1	...	1
Tuberculosis Pulmonalis ...	1	2	3
General Diseases.			
Anæmia	1	62	63
Diabetes	6	1	7
Starvation	1	..	1
Debility	9	15	24
Rheumatism	2	15	17
Senile Decay	13	145	158
Infantile Debility	1	5	6
Marasmus	1	...	1
Local Diseases.			
Meningitis	2	...	2
Cerebral Hæmorrhage ...	6	...	6
Apoplexy	2	1	3
Hysteria	...	46	46
Convulsions (Infantile) ...	11	31	42
Hemiplegia	2	...	2
Dementia	1	16	17
Carried forward ...			

Table XVIII—(*continued*).

Return of general causes of deaths in Zanzibar Town, during 1922.

Diseases.	Reported by		Total.
	Qualified Practitioners.	Unqualified Persons.	
Brought forward ...			
Local Diseases—(*continued*).			
Diseases of the Circulatory System.			
Pericarditis	9	1	10
Valvular Disease	1	...	1
Heart Failure	7	6	13
Embolism	2	...	2
Diseases of the Respiratory System.			
Bronchitis	5	116	121
Broncho-Pneumonia ...	13	72	85
Asthma	2	8	10
Bronchitis (Capillary) ...	3	...	3
„ (Acute)	6	2	8
Bronchial Catarrh	...	2	2
Acute Laryngitis	1	...	1
Diseases of the Digestive System.			
Hernia (Strangulated) ...	1	2	3
„ (Inguinal)	1	...	1
Diarrhœa	4	95	99
„ (Chronic) ...	...	13	13
„ (Infantile) ...	3	2	5
Abscess (Hepatic)	1	...	1
Cirrhosis (Hepatic)... ...	2	...	2
Jaundice	3	...	3
Peritonitis	4	...	4
Intestinal Obstruction ...	1	...	1
Intussusception, Laparotomy, Shock	1	...	1
Diseases of the Urinary System.			
Nephritis (Chronic) ...	1	...	1
Cystitis Pyogenic ...	1	...	1
Uræmia	1	...	1
Chronic Cystitis	1	...	1
Bright's Disease	5	4	9
Disease of the Kidneys ...	...	22	22
Spina Bifida	1	...	1
Carried forward ...			

Table XVIII—(*continued*).

Return of general causes of deaths in Zanzibar Town, during 1922.

Diseases.	Reported by		Total.
	Qualified Practitioners.	Unqualified Persons.	
Brought forward ...			
Local Diseases—*(continued).*			
Diseases of the Generative System.			
Delayed Labour	5	2	7
Puerperal Septicæmia ...	...	3	3
Uterine Abscess	...	1	1
Ruptured Uterus	1	...	1
Eclampsia	1	...	1
Diseases of Connective Tissues.			
Abscess	6	2	8
Elephantiasis	...	3	3
Disease of the Skin.			
Ulcers	1	1	2
Injuries.			
General	22	2	24
Local	11	...	11
Surgical Operation ...	1	...	1
Nematoda.			
Filariasis	1	...	1
Ankylostomiasis	10	3	13
Total ...	339	923	1262

PART X.—VITAL STATISTICS.

Tables XV to XIX deal with births and deaths in the Town and Islands.

A reference to Table XIX shows that for the last ten years the deaths in the Town area have greatly exceeded the births, whereas in the country districts the births nearly equal the deaths. Taken as a whole, the death-rate is far higher than the birth-rate. Large families are rarely seen and the death-rate among children is high, the total number of deaths under one year being 101, and under five years 63 As pointed out in last year's report, all vital statistics are based on the census of 1910 and accurate figures cannot therefore be given. The methods of death and birth registration are the same as detailed in the previous year's report, and the remarks then made still hold good.

Table XIX.

Deaths registered in the Island of Zanzibar during the years 1913-1922.

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
Town ..	1128	1317	1008	1168	1255	1359	1180	1083	1076	1262
Mkokotoni Dist. ..	889	801	1005	881	947	1109	859	800	893	888
Mwera ,, ..	766	721	829	814	844	955	718	719	780	803
Chwaka ,, ..	328	299	378	394	444	451	402	439	512	504
Total ..	3111	3138	3220	3257	3490	3874	3159	3041	3261	3457

Table XX.

Monthly Rainfall—Zanzibar Town, 1913 to 1922.

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	Average for 10 years
January ...	0·39	2·84	1·74	1·63	2·20	2·33	2·02	0·00	1·39	0·00	1·45
February ...	1·37	0·05	0·76	3·50	4·29	1·36	1·07	0·08	2·48	0·00	1·49
March ...	9·99	8·56	6·03	2·29	4·46	4·37	7·27	1·19	4·77	3·84	5·27
April ...	17·59	12·69	9·62	33·35	16·63	11·55	8·85	8·47	17·00	2·10	13·77
May ...	11·18	3·84	10·30	4·35	10·63	9·66	2·81	15·09	4·58	13·00	8·54
June ...	0·07	0·88	5·00	1·38	4·20	6·27	0·20	0·77	0·37	3·99	2·31
July ...	0·31	0·22	3·94	0·38	1·23	4·86	3·00	0·13	1·62	1·68	1·73
August ...	0·88	3·65	0·45	2·11	2·05	0·60	1·63	1·41	0·59	1·33	1·47
September ...	2·58	1·04	1·17	2·81	2·01	0·76	1·46	1·63	0·32	1·37	1·51
October ...	4·22	0·89	2·63	5·83	2·27	5·77	3·21	5·88	5·39	4·97	4·10
November ...	3·20	4·32	9·38	2·94	6·79	2·18	11·81	1·76	9·41	14·36	6·61
December ...	1·31	4·37	0·61	2·92	0·44	6·79	4·65	7·62	1·79	7·41	3·79
Total ...	53·09	43·35	51·63	63·49	57·06	56·50	47·98	44·03	49·71	54·05	52·04

Table XXI.

Meteorological Observations, Zanzibar Town and Banani, Pemba, 1923.

	Zanzibar Town.						Banani, Pemba.				
			Temperature					Temperature			
	Rainfall	Relative Humidity	Mean Maximum	Mean Minimum	Absolute Maximum	Absolute Minimum	Rainfall	Mean Maximum	Mean Minimum	Absolute Maximum	Absolute Minimum
January ..	0·00	70	87·9	80·2	91·1	78·0	0·24	88·8	79·6	92·0	78·0
February ..	0·00	69	89·1	80·2	92·0	79·1	0·00	90·0	79·4	91·5	78·0
March ..	3·84	72	88·3	80·3	92·0	75·2	6·45	89·2	79·5	91·5	77·0
April ..	2·10	74	87·4	78·7	89·6	76·6	8 85	88·3	78·9	91·0	76·0
May ..	13·00	78	82·9	75·5	87·1	72·7	22·19	84·8	76·5	90·0	74·0
June ..	3·99	79	81·9	74·0	84·4	72·0	4·13	83·8	75·3	87 0	73·0
July ..	1·68	76	80·8	72·4	82·6	68·7	1·43	82·4	73·2	84·0	72·0
August ..	1·33	79	81·4	72·7	83·2	71·7	2·94	82·7	73·4	85·0	72·0
September ..	1·37	76	82·7	73·2	85·4	69·7	1·17	84·5	74·2	86·0	73·0
October ..	4·97	74	84·0	75·2	86·0	73·5	1·83	86·3	76·1	89·0	75·0
November ..	14·36	75	85·2	77·2	88·0	74·9	9·76	86·6	77·6	89·0	76·0
December ..	7·41	74	86·4	78·6	88·2	74·7	7·88	87·4	78 5	90·0	74·0

PART XI.—CONTROL OF OPIUM.

The controlled issue of opium to registered habitués in Zanziba shows a further decrease in their number from 167 in 1921 to 156 and a decrease in average monthly consumption of opium from 4 lbs 1 oz. to 3 lbs. 9 ozs.

The following table shows the races and sexes of those in th register at the close of 1922 as compared to 1921 :—

Table XXV.

Races.	Males.	Females.	1922. Total.	1921. Total.
Indian :—				
Ismaili Khoja ...	8	24	32	34
Suni-Mohammedan ...	26	8	34	37
Ithnasheri Khoja ...	5	5	10	11
Banyan ...	6	0	6	6
Pathan ...	0	0	0	2
Baluchi ...	3	0	3	3
Bohora ...	1	0	1	1
Swahili ...	42	3	45	48
Arab ...	18	0	18	18
Persian ...	2	0	2	2
Shihiri ...	2	0	2	2
Gazija ...	3	0	3	3
Total ...	116	40	156	167

Financial.

The sanctioned budget of the Public Health Department fo the year 1922 was Rs. 2,93,355 and the amount actually spent wa Rs. 2,58,165.

The vote for the Suppression of Infectious Disease was found inadequate owing to the continuance of small-po throughout the year and the precautionary measures adopted t combat the disease. A further provision of Rs. 5,000 was allowed

Expenditure.

Vote.	Estimated.		Actual Expenditur	
	Rs.	£.	Rs.	£.
Personal Emoluments ...	2,35,625	15,708	—	—
Other Charges ...	57,730	3,849	—	—

B. SPEARMAN,
Senior Medical Officer of Health

Zanzibar, 28th February, 1923.

REPORT ON THE PUBLIC HEALTH DIVISION, PEMBA,

FOR THE YEAR 1922.

WETI.

General.—The year 1922 saw the establishment of a second Medical Officer in Pemba. Dr. Howard was posted to Weti in November, 1921, and remained in charge throughout 1922. In addition to his duties as Medical Officer he acted as Medical Officer of Health for the Weti District, while the Medical Officer, Chake Chake, was Medical Officer of Health for Chake Chake and Mkoani Districts.

Unfortunately, there was no corresponding increase in the Health Office staff at Weti, nor had provision been made in the estimates for any new works or improvements connected with the Department, so that the record of the year is of necessity a barren one. It is greatly to be hoped that some of the more urgent sanitary needs of the district will now receive attention.

The year was remarkable for its rainfall, which totalled 104.72 inches, *i.e.*, 35.5 inches above the average for the last 10 years, and 26 inches above the previous maximum for the decade. While the rain was fairly evenly distributed throughout the year, the great excess of fall occurred during the last four months. The growth of vegetation was naturally excessive, and this added to the difficulties of the bush clearing and swamp drainage. On the other hand, there did not seem to be any great increase of the mosquito nuisance, probably due to the fact that many larvæ got washed out to sea by the great rush of rainwater.

Epidemic Disease.—The district was free from any serious epidemic throughout the year. This is remarkable in view of the large numbers of clove pickers who came up from Zanzibar and from Tanganyika Territory during the last quarter. No cases of chicken pox, mumps or measles were observed, and only three cases of whooping cough. No small-pox occurred in the northern part of the Island. There was no true epidemic influenza, but there were a number of cases of infectious colds, characterized by coryza and sore throat and cough, with little or no pyrexia, such as are often called mild influenza during a non-epidemic period, though they are probably due to an allied though specifically distinct germ.

GENERAL SANITARY MEASURES.

Disposal of Refuse.—Probably the most urgent need of the moment is a proper incinerator. This will be erected during the coming year.

Water Supply.—Hitherto one of the best sanitary features of the township has been an abundant supply of pure water. The

spring was examined by the Government Geologist when he visited Pemba, and it was pronounced to be an excellent supply.

Disposal of Night Soil.—There are no public latrines in the township. Much use is made of the foreshore. Most of the older houses have privy pits.

Vaccination.—Previous health reports have called attention to the great difficulty of maintaining a constant supply of active vaccine owing to the lack of ice for storage. This year a weekly supply of ice was sent up from Zanzibar with the vaccine packed adjacent to it. A real advance was achieved as the vaccine arrived in active condition. By dint of keeping it on the ice for three days, and then packing it into a thermos flask with the remains of the ice, it was possible to keep it sufficiently cool for at least six days. It is probable that little if any inert vaccine was used this year at Weti.

All passengers from Zanzibar are examined on arrival, and if they do not show satisfactory marks they are re-vaccinated. Also no passenger can book from Pemba to Zanzibar till his vaccination certificate has been inspected; if he has no satisfactory marks it is presumed that inert lymph must have been used at the previous vaccination and he is re-vaccinated. In this way most of the unsatisfactory vaccination chits which were so prevalent in the past have been eliminated. Altogether 3,683 vaccinations were done during the year, about half these were steamer passengers; the rest were done during systematic visits to each important village centre in the district in turn.

Pariah Dogs.—These had become very common and were most objectionable. During the year 257 were destroyed. Poison was put down (after notice) on two consecutive nights, about full moon, roughly every alternate month. In this way the dogs can be eliminated from the township for a time, but if it is left more than two months they increase again by immigration from the shambas.

Leper Settlements.—During the year 45 huts were built on Funzi. These are reserved for the lepers from Zanzibar, who are to be moved thither early in 1923, when further accommodation is to be provided for the Pemba lepers.

During the year six fresh cases were sent to Nduni and the numbers increased to 35.

A much needed hut for housing leper suspects pending examination was built at Weti during the year.

ROBERT HOWARD,
Medical Officer of Health, Weti District.

Weti, 10th February, 1923.

REPORT ON THE PUBLIC HEALTH DIVISION, CHAKE CHAKE AND MKOANI,

FOR THE YEAR 1922.

CHAKE CHAKE.

Owing to the abnormal rainfall which has prevailed throughout most of the year and the shortage of labour consequent on the claims of the heavy clove crop, there has been a distinct setback in the sanitary conditions of Chake Chake. Whereas at this time last year the town area was reasonably clear of overgrowth, it has now reverted to something comparable to bush conditions. As a consequence mosquitoes have been more prevalent.

Sullage pits have in many cases been filled to overflowing by the heavy rainfall. It has been difficult, in the absence of drying arrangements, to burn any considerable proportion of the garbage on the small improvised incinerators.

Market.—There has been an improvement in the condition of the market generally; it is, however, difficult to keep the meat section in an inoffensive condition—this section is too small for the trade which has been carried on during the clove picking.

Epidemic Diseases.—There were three small outbreaks of small-pox in Pemba during the year. In each of the outbreaks vaccination was vigorously carried out in the neighbourhood. And 2,952 vaccinations were done in Chake Chake district and 2,225 in Mkoani district. Lobar pneumonia was unusually prevalent during the third quarter of the year, especially in October.

Leper Settlements.—At present there are 49 lepers at Pujini Settlement and 21 at Kengeja Settlement. During the year there were eight admissions, six deaths and six escapes.

New Works.—A start has been made with the new main surface drainage scheme. The routine work of inspecting houses and oiling sullage pits and water tanks has been carried on as usual.

MKOANI.

There is practically nothing new in the sanitary condition of this district calling for special comment. Labour seems to have been more easily obtained than at Chake Chake and the village itself is more easily kept in a sanitary condition.

P. L. CRAIG,
Medical Officer of Health, Chake Chake.

Chake Chake, 28th February, 1922.

REPORT ON THE BIOLOGICAL SECTION

FOR THE YEAR 1922.

The greater part of the work accomplished by this Section was the routine examination of material supplied by the Medical and Veterinary Officers. As usual a large number of specimens were sent in by the latter officer.

Many questions of a varying nature come before this section, one of the most important being a report made to the Medical Officer of Health on the working and activities of the mosquito brigade. New suggestions were offered as to the reorganisation of the brigade and the extension of anti-anopheline measures on the periphery of the town. Experiments and suggestions were made relative to a hook-worm campaign and it was proved that faulty earth privies harboured many ripe larvæ of *Ankylostoma duodenale*. Considering the large number of natives harbouring these intestinal parasites and their habits of indiscriminate defæcation, soil pollution is rife. It has been suggested, and partly adopted, that an intensive propaganda campaign should be started to combat the disease. Lectures have been given on the subject and a few of the more intelligent natives have assimilated the essential facts concerning the spread of infection and how they themselves contract the disease. A series of charts, pamphlets and lantern slides were procured from the Rockfeller Institute in New York. These should be of great use to the Department in its efforts to spread knowledge regarding hookworm disease. Lectures were given on mosquitoes and other insects harmful to man. It is encouraging to note that a large number of the local Swahilis are now conversant with the life history of these noxious pests.

In collaboration with the Director of Education a popular pamphlet, well and suitably illustrated, is ready for the press. It is intended that in the future a series of these useful publications should be prepared relating to the commonest insect-borne diseases of the Protectorate.

A number of new specimens have been added to the collection of the Public Health Museum. This part of the work has grown much during the last few years and has assumed such proportions that more space is urgently required. It had been hoped that the Peace Memorial Building would be opened in 1922 and that this new Institution would have taken over all collections made for educational and propaganda purposes. If the exhibits are to be kept up to date and be suitably displayed new accommodation will have to be found. Such an institution as proposed cannot fail to have far-reaching effects in spreading useful knowledge of tropical diseases and the means of combating them.

Investigations into local trypanosomiasis of stock were continued. Much material has been collected and when completed will be published separately.

At the request of the Medical Officer of Health collections and dissections of fresh water molluscs were undertaken in a district where cases of bilharziasis had been detected. The most predominant species were collected and worked on. One *Cleopatra ferruginea* was found to be heavily infected with bifid tailed cercariae. Experiments are in hand to prove by infection methods whether the organisms in question are the cercariæ of *Schistosoma hæmatobium* or *mansoni*.

Collections of anopheline mosquitos were made in a district of the island where the endemic incidence of malaria was thought to be high; further, the place selected is heavily infested with *Anopheles costalis* and *funestus* throughout the year. Dissections of stomachs and salivary glands for oocysts and sporozoites were undertaken to see if the natural infectibility of these two species were variable. For some years past it has been thought that localities infested with funestus were more malarial than those where costalis was dominant.

In conjunction with an officer of the Game Department of Tanganyika Territory, arrangements have been made for some of his collectors to start a survey of the mammalian and reptilian fauna of our Protectorate. This collection will be sent to the British Museum for identification and all duplicate specimens will be kept for the local institute.

I would again like to mention the importance of marine biology in the Zanzibar Protectorate. In 1912 a small report was made on the oyster and pearl question. Many natives devote much of their time to fishing. The whole industry and its various side issues are of great importance not only to this Protectorate but to the whole of the coastal belt of East Africa.

Protozoa.—The Biological Section has undertaken the examination of protozoological material submitted for diagnosis by the Medical Officer of Health.

The following protozoa have been recorded :—

Entamœba histolytica.
Entamœba coli.
Giardia intestinalis.
Chilomastix mesnili.
Plasmodium vivax.
Plasmodium malariæ.
Plasmodium falciparum.

In Domesticated Animals.

Trypanosoma congolense.	In cattle, sheep, goats, horses, donkeys, mules and dogs.
Trypanosoma vivax.	In cattle from Tanganyika Territory.
Trypanosoma brucei.	In cattle from Tanganyika Territory.
Trypanosoma evansi.	In camels from Italian Somaliland.
Trypanosoma theileri.	In local cattle.
Trypanosoma lewisi.	In rats.
Theileria parvum.	In cattle.
Babesia bigeminum	In cattle.
Anaplasma marginale.	In cattle.
Anaplasma centrale.	In cattle.
Nuttalia equi.	In horses.
Piroplasma canis.	In dogs.

None of these parasites calls for special comment as they are prevalent throughout East Africa.

The routine examination of morbid material is done in the Bacteriological Laboratory, any protozoa of interest are sent to the Biological Section for confirmation.

Arthropoda.

Spiders.—No venomous spiders have been recorded.

Centipedes.—Several large species of Scolopendridæ are common and justly feared. They can inflict a painful wound with their poisonous mandibles.

Porocephalus armillatus.—Adults of this species have been found free in the abdominal cavity of the common python.

The following insects new to the Zanzibar Protectorate have been identified.

Muscidæ.

Siphunculina sp.—Prevalent in the central market feeding on meat.

Pyrellia sp.—Larvæ were obtained in oranges collected around the market in a rotting condition.

Ceratopogoninæ.

Leptoconops sp.—This interesting blood-sucking fly is abundant in the cattle quarantine park feeding on water buffaloes.

Culicoides sp. near insignicornis.—These flies were captured on Prison Island situated three miles from the island of Zanzibar. They feed with avidity on human blood and cause visitors at certain seasons of the year great annoyance.

Forcipomyia lefanui.—Were captured under the same conditions and have the same habits as the former species.

Culicidæ.

Ficalbia mediolineata.—The pupa of this mosquito was found in an old cement tank close to the town. No further specimens have been obtained.

House flies are not very prevalent in Zanzibar town. At certain seasons of the year, such as during and after the rains, their presence is felt and they soon become a serious nuisance. Considering the number of animals which are permanently housed in this congested city, the absence of a continuous fly plague is astonishing.

The commonest species of muscidæ are—*Musca domestica, Chrysomyia sutorium, Chrysomyia marginale, Sarcophaga sp, Hipplates flavus, Drosophila sp.*

It has been proved that *M. domestica* breeds chiefly in stables and cow byres, *C. sutorium* and *marginale* in organic refuse. Further, the sticky, mucilaginous food given to cattle, consisting chiefly of oil cake, manihoc, etc., is very attractive to flies. Certain members of the mosquito brigade are detailed to hunt for and report the finding of muscid larvæ. The results have shown that the majority are detected in horse, cow and goat manure. The removal of the milch cows to an area outside the town will undoubtedly do away with many potential breeding grounds. The indiscriminate housing of animals as practised here will always provide flies.

One of the outstanding features which would strike a sanitarian visiting Zanzibar is the ubiquitous goat. These inquisitive, omniverous animals are in shops, houses, etc., living in intimate association with man. As long as these beasts are housed anywhere and everywhere so long will the fly nuisance persist.

Various forms of fly-traps have been experimented with, and those designed by Dr. Balfour and Captain Davidson, R.A.M.C., have both given satisfaction. These placed in suitable localities, such as near the markets, refuse destructor and abattoir, should give excellent results. An ingenious mechanical Japanese trap has given satisfaction when used in private houses, but the price is prohibitive for extensive use.

Sweetened arsenite of soda placed in cigarette tins fitted with pierced lids and wicks was efficacious.

Two troublesome and possibly dangerous flies are *Hipplates flavus* and *Drosophila sp*, both species have been noticed feeding on foodstuffs.

Lice are by no means common, a few have been collected from local Swahilis, both species, *Pediculus capitis* and *corporis*, are present. During the north-east monsoon a large number of natives

arrive from various Somali ports and the Island of Socotra. These latter allow their hair to grow long and are heavily infested with head lice. Socotrans spend from two to three months in the town before returning with the south-west monsoon to their homes. The Malindi quarter of the town is very crowded with immigrant natives during the north-east monsoon, and, as they are so lice-ridden and herd together in close quarters, they may become a source of danger in respect of disease carried by lice.

The following table shows the insects of the Zanzibar Protectorate which are known to be carriers of human and animal disease.

Insects which are known to carry Disease to Man and Domestic Animals in Zanzibar.

Diseases of Porotozooal Origin.

Organism.	Host.	Disease.	Vector.
Entamœba histolytica	Man	Amœbic dysentery	Flies.
Lamblia intestinalis	,,	Flagellate dysentery	,,
Plasmodium malariæ	,,	Quartan malaria	Anopheline mosquitos
,, vivax	,,	Benign malaria	,, ,,
,, falciparum	,,	Malignant malaria	,, ,,
Trypanosma congolense	Cattle	Trypanosomiasis	Horse Flies (Tabanidæ)
Babesia bigeminum	,,	Red-water fever	Ticks
Theileria parvum	,,	East-Coast fever	,,
Nuttalia equi	Horses and Donkeys.	Biliary fever	,,

Diseases of Helminthal Origin.

Organism.	Host.	Disease.	Vector.
Dipylidium caninum	Man and dogs	Tæniasis	Dog lice and fleas
Ankylostoma duodenale	Man	Ankylostomiasis	Flies
Microfilaria bancrofti	,,	Filariasis	Mosquitos
Filaria immitis	Dog	,,	,,
Hymenolopsis diminuta	Man and rats	Tæniasis	Dog lice and fleas

Diseases Attributable to Acarina and Insects.

Organism.	Host.	Vector.
Larvæ of Cordylobia anthropophaga	Man and animals	Dermal myiasis
,, ,, Oestrus ovis	Sheep, goats and man	Nasal myiasis
,, ,, Gastrophilus equi	Horses, mules & donkeys.	Gastric myiasis
,, ,, Chrysomyia	Man and animals	Dermal Myiasis
Sarcoptes scabei	,, ,, ,,	Itch
Pediculus capitis	Man	Pediculosis of head
,, corporis	,,	,, ,, body
Phthirius pubis	,,	Pediculosis axilla and pubis
Dermatophilus penetrans	Man and animals	Severe cutaneous irritation
Porocephalus armillatus	,, ,, ,,	

Mosquitoes —Much time has been devoted to this problem in relation to anti-malarial measures. The mosquito fauna of the island has been worked at and a great number of species identified. In former years the mosquito index was compiled on larval findings only with the natural result that *Stegomyia fasciata* seemed to be

our dominant species, on further investigation and by the systematic collection of adults in selected districts of the town, the results obtained by larval collections proved erroneous.

It is certain that the most dominant and ubiquitous culicid is *Culex fatigans*, this species breeds in countless numbers in the innumerable unprotected cesspools in the town of Zanzibar. Year by year more of these latter are fitted with concrete covers, including a manhole through which oil can be poured; until all of them are controlled so long will *Culex fatigans* be prevalent. *Stegomyia fasciata* is more easily attacked and its incidence has been much lessened by the efforts of the mosquito brigade.

Anophelinæ.—Anopheles costalis is the only species recorded from the town area. No records of *A. funestus*, which is so prevalent in various out-districts, have been attained. The elimination of *A. costalis*, so cosmopolitan in its selection of breeding grounds, is always difficult. During the greater part of the year the town is free of anophelines and only under phenomenal weather conditions do they reach the city. Most of their adventitious breeding grounds on the periphery of the town are now well known and are being gradually eliminated. During former years, as described in the Biological Report for 1917, mosquito larval traps were used chiefly as indicators for anophelinæ. The evidence so obtained has proved of the greatest use to the mosquito brigade; many hitherto unknown breeding grounds were brought to light. Likewise, as previously stated, the systematic collection of adults in selected areas forms a most valuable index of the distribution of culicines throughout the year.

The following tables show the numbers of adults collected in various quarters.

TABLE I.

Adult mosquitoes captured in the Central Jail, Kilimani, June, 1921, to June, 1922. Collections made every Saturday.

	A. costalis.	C. fatigans.	S. fasciata.	Rainfall.
June	37	65	1	0.37
July	7	59	2	1.62
August	3	58	0	0.59
September	0	76	0	0.32
October	0	70	0	5.39
November	5	60	0	9.41
December	31	62	0	1.78
January	3	48	0	0.00
February	2	20	5	0.00
March	3	17	0	3.84
April	18	52	2	2.10
May	19	64	0	13.00
June	93	25	0	3.99
Total	227	676	10	

Table II.

Adult mosquitoes captured in the Native Hospital, Zanzibar Town. June, 1921, to June, 1922. Collections made every Monday.

	A. costalis.	C. fatigans.	S. fasciata.	Rainfall.
June	4	59	0	0.37
July	0	44	1	1.62
August	0	26	0	0.59
September	0	15	0	0.32
October	0	37	1	5.39
November	0	39	0	9.41
December	4	41	1	1.78
January	0	50	1	0.00
February	0	35	2	0.00
March	0	47	3	3.84
April	1	36	5	2.10
May	0	55	2	13.00
June	16	81	2	3.99
Total	25	565	18	

Table III.

Adult mosquitoes captured in the European Hospital, Zanzibar Town. June, 1921, to June, 1922. Collections made every Monday.

	A. costalis.	C. fatigans.	S. fasciata.	Rainfall.
June	1	56	2	0.37
July	0	53	0	1.62
August	0	59	0	0.59
September	0	41	2	0.32
October	0	50	5	5.39
November	0	36	7	9.41
December	0	28	9	1.78
January	0	35	9	0.00
February	0	29	2	0.00
March	0	8	13	3.84
April	0	28	7	2.10
May	0	37	7	13.00
June	5	80	7	3.99
Total	6	540	70	

Table IV.

Adults mosquitoes captured in Mr. Dyer's house, Malindi, Zanzibar Town. June, 1921, to June, 1922. Collections made every Tuesday.

	A. costalis.	C. fatigans.	S. fasciata.	Rainfall.
June	0	10	3	0.37
July	0	17	8	1.62
August	0	22	12	0.59
September	0	17	9	0.32
October	0	24	5	5.39
November	0	37	9	9.41
December	0	44	6	1.78
January	0	36	0	0.00
February	0	37	8	0.00
March	0	31	1	3.84
April	0	40	5	2.10
May	0	55	5	13.00
June	0	68	9	3.99
Total	0	438	80	

Table V.

Adult mosquitoes captured in Police Station Kisimajongo, Ngambo. June, 1921, to June, 1922. Collections made every Thursday.

	A. costalis.	C. fatigans.	S. fasciata.	Rainfall.
June	0	69	2	0.37
July	0	34	6	1.62
August	0	55	1	0.59
September	0	26	5	0.32
October	0	24	12	5.39
November	0	28	19	9.41
December	0	40	20	1.78
January	0	24	7	0.00
February	0	19	16	0.00
March	0	12	9	2.10
May	0	57	7	13.00
June	1	117	15	3.99
Total	1	545	137	

The foregoing tables of adults collected in the town and on its periphery are interesting. It is clearly shown that in all districts *Culex fatigans* is the dominant species.

Table No. 1, Central Prison. The anopheline index is high and it will be noticed that *A. costalis* was only absent for two months, this can be accounted for by the proximity of permanent breeding grounds. The prison itself must be very attractive to adults with its ample blood supply, the average number of inmates

being about 150 per diem. The prison is situated about one mile and a quarter from the southern end of the town. During the rains adventitious flight pools are formed and anophelinæ attack the southern end of the city (see records in Table No. 2 Native Hospital). The *C. fatigans* index again shows the dominance of this species. In spite of repeated searches for larvæ of this form in the prison none have been discovered, but there are dwellings with cesspools, etc., unprotected in close proximity.

Table No. 2. The town attack is to be expected shortly after the rains. It is of interest to note that the next table, No. 3, of the European Hospital shows a marked decrease in the number of anophelines. This can be accounted for by the activity of the mosquito brigade and the circumstance that when the rains are at their height most collections of water are well known and are treated.

Tables Nos. 3 and 4. Both show the dominance of *C. fatigans* and a low proportion of *S. fasciata*. It should be noted that the area selected in Malindi (Table No. 4) is negative for anophelines throughout the year.

Table No. 5. A small collecting area in the centre of the native town. During the period of collection no mosquito brigade was working in the district. The *stegomyia* rate is high, the *culex* rate normal. In my opinion this shows that an active brigade soon lessens *stegomyia*, but the *culex* index remains more or less constant.

The only other mosquito in the town area is *Ochlerotatus pembœnsis*. This specie breeds in very brackish water and shows a marked preference for crab holes on the banks of tidal creeks and inlets. Numbers have been captured (adults and larvæ) in the northern district of Gulioni. This mosquito does not appear to move far from its breeding grounds and records of engorged adults have only been obtained from houses in close proximity to tidal creeks. They are active day feeders and cause great annoyance.

Anti-malarial work would be facilitated by legislation prohibiting :—

1. Furrow cultivation (the matutas of the natives) within and near to the periphery of the town.

2. Planting of coconut and allied palms in the town area. It may be noted that Dr. Haworth, Medical Officer of Health of Tanga, has made the interesting discovery that all species of our common mosquitoes breed in the crowns of coconut trees and this has been proved in Zanzibar town.

It is also recommended that intensive garden cultivation should be more restricted. There are areas in the town covered with large trees and bush. Such conditions favour mosquitoes and add

to the difficulties of the mosquito brigade in detecting breeding grounds. A few well-chosen shade trees and ornamental gardens are of no danger and add greatly to the amenities of life. The labour gangs, which during the rains are employed in ditching, etc., could during the dry part of the year profitably spend their time cutting bush and clearing jungle sites, many of which exist in the town of Zanzibar and its immediate surroundings.

Propaganda. Lectures have been given to classes of natives on the life history of mosquitoes and their relation to human disease. In all cases the practical side was aimed at, and pupils were shown as far as possible actual living specimens. Demonstrations were given and breeding grounds of *stegomiya*, *culex* and *anopheles* were shown. A great number of Africans are now conversant with the metamorphosis of the mosquito and while the fact that the insect is actually a disease carrier is still somewhat of a miracle to them reiteration may eventually convince them.

Helminthiasis of Man and Domesticated Animals.

A number of helminths from domestic animals were collected and identified, the following are new to the fauna of the Protectorate :—

1. *Strongylus vulgaris*. (from cæcum of donkey).
2. *Strongylus edentatus*. (from cæcum of donkey).
2. *Strongylus asini*. (from cæcum and encysted in liver of donkey).
4. *Cylicostomum adersi*. (from cæcum of donkey).

Two of these nematodes are new species. A full and detailed description of them was published by Mr. C. L. Boulenger in "Parasitology," Vol. 12 (No. 1 of 1920).

The following is a full list of helminths from man and animals recorded for the Protectorate :—

Man.

Ankylostoma duodenale.	Very common.
Ascaris lumbricoides.	Very common.
Trichocephalus dispar.	Very common.
Strongyloides stercoralis.	Common.
Microfilaria bancrofti.	Common.
Tænia saginata.	Rare.
Bilharzia hæmatobium.	Rare.
Bilharzia mansoni.	Rare.

Domestic Animals.

Cestoda.

Cysticercus bovis.	Cattle.
Cysticercus tenuicollis.	Goats and sheep.
Dipylidium caninum.	Dog.
Dipylidium chyzeri.	Cat.
Dipylidium ærleyi.	Cat.
Moniezia alba.	Goats and sheep.
Moniezia trigonophora.	Goat.
Stilesia hepatica.	Sheep.
Stilesia vittata.	Camel.
Tænia hydatigena.	Dog.
Tænia echinococcus.	Cysticercus in cattle and goats.

Trematoda.

Fasciola hepatica.	Cattle.
Paramphistomum sp.	Cattle.

Nematoda.

Ascaris megalocephala.	Horse.
Ascaridia inflexa.	Fowl.
Belascaris marginata.	Dog.
Belascaris mystax.	Cat.
Strongylus vulgaris.	Donkey.
Strongylus edentatus.	Donkey.
Strongylus asini.	Donkey.
Oxyuris equi.	Donkey.
Oxyuris curvula.	Donkey.
Oesophagostomum columbianum.	Goats and sheep.
Oesophagostomum dentatum.	Pig.
Hæmonchus contortus.	Goats and sheep.
Setaria equina.	Sheep and donkey.
Setaria labio-papillosa.	Ox.
Physaloptera præputialis.	Cat and leopard.
Trichuris ovis.	Sheep.
Trichuris globulosa.	Camel.
Filaria immitis.	Dog.
Ankylostoma caninum.	Dog.
Ankylostoma ceylonicum.	Dog.

Amongst humans the most important helminthal diseases are ankylostomiasis and filariasis. Both have been dealt with by the Medical Officer of Health in various reports.

Amongst domesticated stock *Hæmonchus contortus* causes great losses in lambs, as described in the report of the Veterinary Officer.

Fish.

Experiments have been made with the following fresh-water fish, which are known to be enemies of mosquito larvæ.

Haplochilus playfairii is an extremely hardy fish living well in captivity and is easily transportable. A tank in the Health Office compound is used as a stock pond and from it several swamps and ponds outside the town have been stocked. In captivity these fish feed on all species of mosquito larvæ, but being essentially

surface feeders they are specially useful against anopheline larvæ. *Haplochilus* is an ideal fish with which to stock both garden ponds and wells, they are also of great use in temporary small swamps formed during the rains.

Fundulus guenteri. Not as useful as the former species. In aquaria the males are very pugnacious, killing each other and attacking the females. They feed readily on all species of larvæ.

Tilapia natalensis. These were obtained from fresh-water streams in Dar-es-Salaam, and, as in the case of *Haplochilus*, are very hardy and easily transportable. A number have been introduced into a large tank in the public gardens and no mosquito larvæ have been found since. They are active bottom feeders and are of use in deep wells against *stegomyia* larvæ. In captivity they occasionally rise to the surface and take anopheline larvæ, but many of the latter seem to escape their notice. Some of these fish placed in the Mwera River have attained a size of six to eight inches. They must be palatable, as natives have constructed traps and nets to catch them. They therefore may serve a dual purpose both as enemies of mosquito larvæ and an article of food.

Fish General.

The market of Zanzibar town is always well supplied with fish. The natives are well acquainted with the various kinds which are poisonous as an article of food and with those which are able to inflict poisonous wounds or bites.

The following poisonous species have been noted.

Muraenidæ. The sea eels are abundant on all foreshores of the Protectorate and are capable of inflicting a serious bite.

Synancea verrucosa. The poison apparatus is connected with the dorsal fin, which is supplied with poison reservoirs. Symptoms : severe pain at the site of puncture.

Plotosus sp. Poison gland at base of dorsal fin, one of the few salt-water barbels or cat fish.

Scorpæna sp. Two species have been brought to notice. The dorsal fin and a spine on the opeculum are both considered poisonous.

Trygonidæ. The sting rays are justly feared. The tails of these large fish are armed with powerful long spines, when incautiously handled a blow from the tail can cause a bad wound. The flesh of some fish is at times poisonous. When eaten symptoms of poisoning rapidly supervene, at times causing death. All species of the globe fishes (*Diodon*) are recognised by the natives as being poisonous. As most fish derive their poisonous properties from their food, which often consists of medusæ or decomposing

substances, the removal of the intestines immediately after capture eliminate the poisonous substances. A large amount of sun-dried and smoked fish is sold in Zanzibar town. The larger fish, such as various species of shark, horse mackerel, etc., are sun-dried and salted, while the smaller varieties are split and spitted on a stick then thoroughly roasted and smoked in front of a hot fire. Oysters, which have been well boiled, are an article of food much relished by the natives; dried octopus is also appreciated.

At times fish improperly cured is found to harbour larvæ of various muscidæ, even in well cured stock numbers of beetles, (*Dermestidæ*) and their larvæ can be found.

As dried fish, especially shark, emits a most evil odour and is also a focus for the breeding of flies and other insects, the industry must be classed as objectionable.

Reptilia.

The Protectorate is astonishingly free from venomous snakes. The following snakes have been recorded :—

Naja nigricollis. The black-throated cobra. This venom-spitting snake is common in Pemba and has been recorded from the north of Zanzibar Island. No data have been received of this specie attacking man, on the other hand dogs have received doses of venom in their eyes causing intense inflammation of a transitory nature.

Naja haiæ The Egyptian cobra. A few specimens have been captured in both islands. No records as to their attacking man.

Dispholydus typus. The boomslang. Is of common occurrence. No records as to the effect of their venom on man or animals.

Birds.

A number of new specimens were collected and identified by Dr. V. G. L. van Someren, of Nairobi.

Many of our local birds are injurious to grain crops, especially the following species :—

Hyphantornis aureoflavus.	Orange-yellow weaver bird.
Munia oryzivora.	Java sparrow.
Spermestes guttatus.	Spotted mannikin.
Pyromelana flammiceps.	Scarlet weaver finch.
Pyromelana nigriventer.	Bishop bird.
Vidua serena.	Whydah finch.
Passer diffusus.	Southern sparrow.
Passer simplex.	Sparrow.

The natives have devised various methods of frightening these pests away from their fields such as gongs made fron old kerosene tins, scare crows, and slings firing small clay pellets and stones.

All birds referred to are residents, most of them gregarious, especially those of the genus *Hyphantornis* and *Spermestes*. *Hyphantornis* congregate in great flocks and build covered retort-shaped nests so conspicuous on the branches of coconut trees.

The Indian crow (*Corvus splendens*) is a great nuisance in the town as its depredations on young chickens and pigeons are great. Rewards are now given to anyone bringing in the eggs of this species.

Game birds are scarce—a few guinea fowl, snipe, lapwing, duck and an occasional quail are received. With the assistance of the Game Ranger of Tanganyika Territory a number of *francolins* were procured and liberated in various parts of the island. Up to date none of them have been seen; it is possible that they have succumbed to the ravages of ground vermin.

It was thought that the introduction of these birds might serve two purposes. Firstly as an additional article of food for the natives whose ordinary diet is so lacking in animal protein; they are easily snared. There are areas far removed from the littoral in the centre of the island where fish their chief animal food is expensive and not easily procurable.

Secondly as a pleasant pastime for the local sportsmen.

Mammals.

The most important are rats on account of their relationship to human plague. The following species have been recorded :—

Rattus rattus rattus.
Rattus norvegicus.

Both the black and brown rat are common in all sections of the town and harbour fleas, most of them *Xenopsylla cheopis*. Other rodents of importance are the East African giant rat (*Cricetomys gambianus*) and the small shrew (*Pachyura sp*), these latter are also infested with fleas (*X. cheopis*). The control of rodents is carried out by trapping and poisoning.

Wild Pigs. The red bush pig (*Potamochoerus sp*) is one of the greatest scourges in the country, the amount of damage done to native crops is considerable. The only practical measures of control is poisoning with arsenic, trapping and hunting. Experiments were undertaken in 1921 to introduce swine fever. Virus was obtained from the Veterinary Laboratory in Kenya Colony and it was proved that the local wild pig was susceptible both by inoculation and close contact. Pigs were inoculated and liberated

at their place of capture, but the result was negative. Probably wild pigs under natural conditions do not herd together.

Leopards during the last few years have been responsible for a certain amount of damage. Many goats and other domestic stock have been killed. The natives build the usual African fall trap, by which means a few are captured.

Major E. C. Oliver, of the Sudan Government, has used with great success *strychnine hydrochloride* as a poison, about five grains is a lethal dose.

This substance should be tried both for leopards and pigs under the control of a responsible officer.

Monkeys. Two species, *Cercopithecus albigularis* and *pygerythrus*, are common and have been incriminated as great depredators of certain crops. No active measures are taken against them. The pelt of the former species has some commercial value.

W. MANSFIELD-ADERS,
Economic Biologist.

REPORT ON THE VETERINARY SECTION

FOR THE YEAR 1922.

DISEASES OF STOCK.

East-Coast Fever.—Two outbreaks of this disease occurred during the year; one at Pigaduri where in a herd of 33 cattle, which arrived with the disease from Tanga, twenty-two were found infected on microscopic examination. Accounts of these outbreaks are given in Table I and Table II respectively.

In all 307 animals were examined for East-Coast Fever and 137 found infected; 110 being imported cattle. Out of eight calves examined, six were diagnosed suffering from the disease. Spleen smears of 118 Kismayu cattle were microscopically examined, and 78 revealed Koch's blue bodies.

The dipping tank at Mji Mpia was in use throughout the year, cattle were dipped there at a five-day interval. In all 14,924 dippings were performed.

Chemical analysis of the dipping fluid was made monthly at the Public Health Laboratory. Samples were also sent as controls to the Chemical Officer, Nairobi, and corrections made from time to time according to the reports received.

Trypanosomiasis.—In all 811 animals were examined and 52 found infected. The following types of parasites were seen :—

Trypanosoma congolense (32) in cattle, horses, mules, donkeys, dogs and camels (local and imported).
Trypanosoma vivax (14) in cattle from Tanga, Bagamoyo and Lamu.
Trypanosoma uniforme (2) in Bagamoyo cattle.
Trypanosoma brucei (2) in a Lamu cow and a camel.
Trypanosoma pecaudi (2) in Lamu mules.

Animals showing parasites in their blood were either killed in the Quarantine Park or sent back to their ports of origin.

Tuberculosis.—This disease has been found in all breeds of cattle, viz., Boran, Indian, and indigenous. It is impossible to estimate the incidence, but it can safely be said that at least 5% of the town dairy cows are suffering from the disease. It is a well known fact that the degree of infection is favoured by close herding in ill-constructed and badly ventilated sheds, with no adequate arrangements for light and air. It is no wonder therefore that the infection should spread among local cows. who rarely see the light of the day and are close-penned in their dark and insanitary sheds for the greater part of their lives. During the year five animals were proved positive on microscopical examination out of a total of 86.

Piroplasmosis.—Two cases detected in cows from Government Stables.

Sarcosporidiasis in a slaughter ox imported from Kismayu.

Pleuro-pneumonia contagiosa.—Very common in goats and sheep imported from Kismayu and Lamu.

Hæmonchiasis.—Five experimental sheep and one calf died from this disease.

Diseases of Equines.

Horse-sickness.—Only one case occurred and resulted in death.

Glanders.—No case detected.

Epizootic lymphangitis.—One case reported in a donkey from Government Stables. This animal was found infected on examination and destroyed.

Ulcerative lymphangitis.—One case seen in a cart mule.

Filariasis.—In a donkey imported from Pemba.

Trypanosomiasis.—Ninety-three local donkeys were examined and four of these showed *T. congolense* in their blood.

Three local horses were examined and one found infected.

Diseases of Canines.

Rabies.—No case reported or seen.

Importation of Animals into Pemba.

The importation of animals has now been allowed under certain conditions. The rules governing the direct importation of animals from Dar-es-Salaam to Chake Chake were drawn up by the Veterinary Adviser under Decree No. 21 of 1922.

A small area near Chake Chake Town has been fenced and is used as a Quarantine Station.

Veterinary Hospital.

Four hundred and seventy-seven animals were treated at the Veterinary Hospital, Kisiwandui, as follows :—

Sheep	Donkeys	Mules	Goats	Cats	Horses	Oxen	Buffaloes	Dogs	Turkeys
196	216	20	2	4	17	3	2	13	4

With the exception of sheep suffering from *hæmonchiasis*, the rest were treated for such common complaints as galls, sores, wounds, lameness, debility or such internal derangements as constipation, colds, coughs, etc., etc.

Table I.

Death report for 1920-1922 :—

	1920	1921	1922
Milch Cows (ex-dairies)	32	36	38
Calves (ex-dairies)	16	24	11
Cart-bullocks	10	9	6
Oxen	39	8	45
Goats	247	197	380
Sheep	9	10	8
Horses	2	4	3
Donkeys	9	6	18
Mules	2	1	3
Buffaloes	4	3	1
Camels	5	2	1
Total	375	300	514

During the year 514 deaths occurred in stock from the town and Quarantine Park. The figure shows a slight increase in the death-rate among cattle and goats. The loss in the former was due to an outbreak of East-Coast fever in a mob of slaughter cattle numbering 159 imported from Kismayu. As there was at the time of importation a great scarcity of grass on the pasturages surrounding the town, these animals were sent to better feeding grounds at Beit-El-Mal, about 11 miles from the town. The first death from East-Coast fever occurred on the 15th day and the remainder were at once returned to the Quarantine Park and dipped at three-day interval. Out of the batch 66 succumbed to East-Coast fever. As usual a large number of goats died from pleuro-pneumonia.

Table II.

Animals imported and quarantined at Pigaduri.

	1920	1921	1922
Oxen	1637	1298	2987
Cows	92	156	176
Calves	43	42	43
Goats	8910	9406	12994
Sheep	1258	1858	3518
Horses	9	5	8
Donkeys	18	24	50
Mules	10	1	7
Camels	41	16	16
Dogs	5	3	2
Foals	—	1	—
Cats	2	—	—
Total	12025	12838	19801

The above table shows a remarkable increase in the number of animals imported. As in former years, most of these arrived from Kismayu and Somali ports. A small percentage came from Tanganyika Territory With the exception of a few horses and dogs, which were accompanied by satisfactory veterinary certificates, all animals imported were quarantined at Pigaduri at the discretion of the Veterinary Officer. All cattle imported are dipped at the Quarantine Park at a three-day interval. There was an outbreak of East-Coast fever in the Park among a herd of cattle imported from Tanga. All were detained and slaughtered in quarantine. The total nmuber of dippings carried out at Pigaduri was 6,416, Two hundred and thirty oxen, 1 camel and 14 goats were killed in Quarantine.

Table III.

Stock exported :—

	1920	1921	1922
Oxen	50	51	266
Cows	—	5	6
Calves	3	5	—
Goats	161	176	258
Sheep	14	23	53
Kids	20	6	32
Donkeys	4	—	41
Mules	—	—	1
Horses	—	1	5
Buffaloes	1	1	4
Camels	6	1	—
Dogs	1	1	—
Total	260	270	666

The above table shows an enormous increase in the number of animals exported. They went chiefly to Pemba with the exception of a few milch goats and horses which were sent to Dar-es-Salaam. Twenty goats and four buffaloes were exported to Uganda.

Table IV.

Animals examined and slaughtered in 1922, compared to the previous two years.

	Slaughtered in Government Abattoirs.			Carcases Condemned.					
				Wholly.			Partially.		
	1920	1921	1922	1920	1921	1922	1920	1921	1922
Oxen ..	1395	1413	2262	36	19	80	1141	1027	1644
Cows ..	41	63	56	..	1	..	40	76	11
Calves ..	16	32	5	..	..	..	..	..	..
Goats ..	14949	12781	12737	10	20	32	3286	2313	1974
Sheep ..	1106	1452	2492	2	1	14	538	425	850
Camels ..	20	10	3	..	..	..	18	4	3
Buffaloes ..	1	6	6	..	..	..	..	..	..
Total ..	17528	15757	17561	48	41	126	5027	3856	4482

All meat is examined before being passed to the public. Slaughtering usually takes place in the morning. Animals for killing are brought to the abattoir 12 to 16 hours before slaughter for *ante-mortem* examination and penned there over night. Animals showing any signs of disease, emaciation or debility are rejected and returned to their owners. No record of such beasts has been kept; next year the exact number will be published. Seventy-nine carcases were wholly condemned for measles, whilst 20 showing only slight infection were passed for sale after sanction by the Medical Officer of Health.

Thirty-two goats and 14 sheep carcases were totally condemned for *pleuro-pneumonia contagiosa* and emaciation.

A great number of slaughter cows, chiefly of Indian breed, showed *echinococcosis*, lesions were found in the liver and lungs. *Distomiasis* of the liver was seen in some oxen imported from Dar-es-Salaam. Tuberculosis was detected in a Kismayu ox; lesions were confined to the thorax.

Table V.

Post-Mortems :—

	No. Performed.	Deaths from E. C. Fever.	Tuberculosis.	Trypanosomiasis.	Actinomycosis.	Hæmonchiasis.	Pleuro-Pneumonia Contag.:	Poison.	Horse-Sickness.	Epizooti-Lymphangitis.
Oxen ..	37	25	1	2	1	..	..	1	..	..
Cows ..	38	16	3	..	1	..	..	1	..	..
Calves ..	11	6	..	..	..	1	..	1	..	..
Goats ..	4	..	..	1	..	..	3	..	..	..
Sheep ..	7	..	..	..	..	5	..	2	..	..
Horses ..	2	..	..	..	..	..	..	..	1	..
Donkeys ..	3	..	..	..	..	..	..	..	..	1
Total ..	102	47	4	3	2	6	3	5	1	1

The remainder were either from such common complaints as pneumonia, congestion of the lungs, pericarditis, malnutrition, retention of placenta, etc., or were not diagnosed.

TABLE VI.

Examinations carried out in Veterinary Laboratory:—

East-Coast Fever, local stock:—

	No. examined.	Positive.	Negative.
Cart bullocks	5	1	4
Bombay cows	29	11	18
Socotran cows	26	7	19
Calves	8	6	2
Buffaloes	1	—	1
Total	59	27	42

East-Coast Fever, imported stock:—

	No. examined.	Positive.	Negative.
Kismayu cattle	118	78	40
Lamu cattle	82	8	74
Dar-es-Salaam cattle	10	—	10
Bagamoyo cattle	5	2	3
Tanga cattle	33	22	11
Total	248	110	138

Trypanosomiasis, local stock:—

	No. examined.	Positive.	Negative.
Donkeys	93	4	89
Dogs	62	—	62
Oxen	5	1	4
Calves	3	—	3
Horses	3	1	2
Mules	1	—	1
Goats	6	4	2
Total	173	10	163

Trypanosomiasis, imported stock:—

	No. examined.	Positive.	Negative.
Kismayu cattle	168	—	168
Dar-es-Salaam cattle	217	10	207
Lamu cattle	82	8	74
Tanga cattle	37	9	28
Bagamoyo cattle	49	12	37
Kismayu goats	60	—	60
Mules	5	2	3
Camels	13	1	12
Horse	1	—	—
Total	638	42	596

SHAH MOHAMMED KHAN,
Veterinary Officer.